



The Bitcoin Network and Modern Global Finance

ABSTRACT

The impact of technology has never been more prominent in the day to day lives of human beings around the world. However, it is becoming increasingly apparent that some modern technological advancements are unrepresented in the global financial and banking systems. Although its network is complex and not easily comprehensible, Bitcoin assists in resolving this problem. Bitcoin is a digital peer-to-peer (P2P) cash system that was created on the heels of the 2008 financial crisis with the purpose of establishing computerized trust and disconnection from the centralized web of the global financial and banking environments. Bitcoin is produced continuously at a known rate, has a fixed supply, is highly divisible, is difficult to counterfeit, and has no controlling central authority. While these characteristics certainly give Bitcoin a competitive advantage against other popular store's of value, such as fiat currency and gold, there are still many critics of the network's capabilities and influence. Major outspoken critics include Warren Buffet (Berkshire Hathaway), Peter Schiff (Gold Advocate), Paul Krugman (Keynesian Economist), Janet Yellen (Former Fed Chair), and Jamie Dimon (JP Morgan). More recently, however, Jamie Dimon and Janet Yellen have pivoted their opinions regarding the asset class.

Value is the most important aspect of any "store of value." Cryptocurrencies are notoriously volatile assets, from 2015 to 2020 Bitcoin witnessed a 2,144.98% increase in value compared to gold's 43.23% and the U.S. Dollar's -7.41% in purchasing power; this rapid increase in value is viewed as a speculative bubble by many of the aforementioned critics. However, the notion that today's value is a speculative bubble is ill founded and largely biased. Two valuation methodologies that counter argue this, the stock-to-flow model and Metcalfe's Law, produce detailed valuation metrics based upon pre-existing and widely accepted predictive models. The developer or node-based support of the network is a key value-added feature to the asset class as observed by one of these models. The further dissection of the intricacies of Bitcoin mining, transactions, and incentives visualize how they add additional value by expanding the network's capabilities. This report's primary focus is to cast light on the influences of the network's intricacies and the environment it creates, and justify why its value will continue to grow sustainably.

PART I: NUANCES OF THE NETWORK

WHAT IS BITCOIN?

Bitcoin is a digital peer-to-peer (P2P) cash system created by the anonymous Satoshi Nakamoto on the heels of the 2008 Financial Crisis. The Bitcoin founder's name, "Satoshi", indicates the most basic denomination of a Bitcoin; one satoshi is the equivalent of 0.00000001 Bitcoin. The Bitcoin Network is built on a SHA256 algorithm and functions using distributed ledger technology (DLT) and a proof-of-work protocol which allows the blockchain to be secure and not require a central authority to establish trust. SHA2 algorithms were designed by the United States National Security Agency (first published in 2001) and contain the principles that give the network its anti-tamper properties and the ability to maintain the integrity of the blockchain's data. DLT is a digital process for recording transactions in which the transactions and their details are recorded simultaneously in multiple places. By recording a transaction in multiple places, the network can function without any single central authority establishing trust; instead, the demonstration of trust is exhibited by the millions of computers, formally called 'nodes', that make up the Bitcoin Network through an important protocol called 'proof-of-work'. Thus, the overarching intention of the Bitcoin network is simply (1) to allow individuals to anonymously and securely store wealth and (2) transfer wealth securely without having to run through a central authority (i.e. a bank or related institution). As a result of this, the Bitcoin Network functions 24 hours a day, 7 days a week, and has maintained an uptime of 99.99% since its inception on January 3, 2009. Bitcoin never shuts down, thus allowing users to transact at any time of the day or week.

As stated in the Bitcoin Whitepaper, the steps in which the network functions are as follows:

- 1) New transactions are broadcast to all nodes.
- 2) Each node collects new transactions into a block. Each node works on finding a difficult proof-of-work for its block.
- 3) When a node finds a proof-of-work, it broadcasts the block to all nodes.
- 4) Nodes accept the block only if all transactions in it are valid and not already spent.
- 5) Nodes express their acceptance of the block by working on creating the next block in the chain, using the hash of the accepted block as the previous hash.

*It is important to note that nodes always deem the longest chain to be the correct one and continually work to extend it.

The several unique nuances that allow the above steps to function and what sets Bitcoin apart as a digital peer-to-peer cash system will be further developed through this article. Aside from its unique functionality and utility as a secure payment system that doesn't rely on the trust of an institution, Bitcoin exhibits qualities such as scarcity (there will only ever be 21 million total Bitcoin), portability, and divisibility that make its long-run sustainability attractive.



BITCOIN STORAGE

Before diving into some of the intricate details and processes that make up the greater Bitcoin Network, it's important to discuss a more simple, but nonetheless, important aspect of Bitcoin as a digital peer-to-peer cash system. Unlike its traditional counterparts, Bitcoin can't be stored in a leather vessel or with the traditional savings organizations many individuals are familiar with; instead, those who hold Bitcoin do so using digital or "hardware" wallets. Digital wallets are often applications on one's cell phone or laptop and hardware wallets are physical devices that can hold hundreds, and in some cases thousands, of different currencies at a single time. More recently, cryptocurrency exchanges have implemented digital wallets that allow clients to store their cryptocurrencies on the exchange itself. This is something that is heavily criticized by those in the community because it forces the holder to store their crypto with a "centralized authority," however, it is still a viable way to store one's digital currencies dependent upon the validity of the exchange. Software wallets aren't as secure as hardware wallets because they must be connected to the internet and are vulnerable to malware attacks, but are still secure and difficult to infiltrate. On the flip side, software wallets are more accessible for the investor who moves his or her crypto often. While the tangibility and overall security of digital and hardware wallets differ, they share common characteristics that allow them to store cryptocurrencies in similar ways. All cryptocurrency wallets rely on the use of ECDSA key pairs, which, in simple cryptography terms, requires a public key and a private key to protect (encrypt) bits of data.

The public key, which can be seen by anyone, is a string of thirty-four numbers and letters that acts as an identification tag users can send cryptocurrencies to. The number of unique public addresses has quickly grown since Bitcoin's inception, the chart produced by Blockchain.com to the right shows there are 47.882 million unique public addresses and growing. On the contrary, private keys should only be known by the users themselves and can be used to recover and access a user's cryptocurrencies. If the private keys of a wallet are lost then the user loses the Bitcoin, or other cryptocurrencies, stored on the wallet and they are in essence removed from active circulation. The role of public keys, or addresses, is important as it allows users to stay anonymous while keeping their transactional data public on the Bitcoin blockchain, which are critical aspects of Bitcoin as a peer-to-peer cash system.

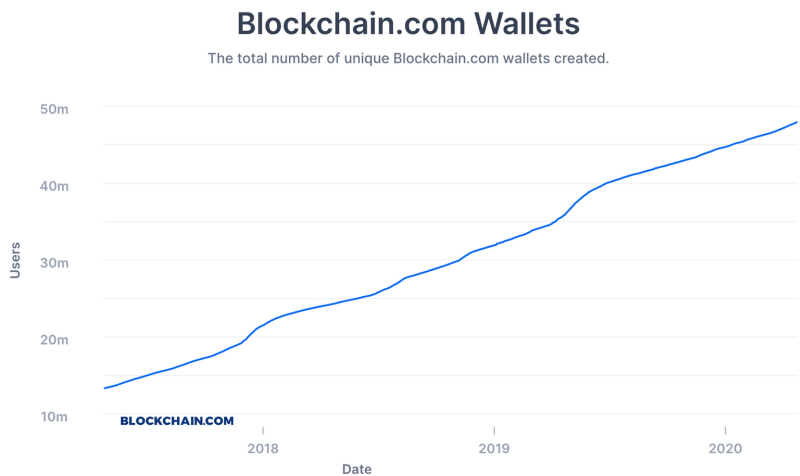


Figure 1

It's also important to make note of the blockchain's role in Bitcoin transacting and storage. The Bitcoin blockchain is an ever-growing database of transactional data produced by Bitcoin users. While the blockchain stores the data of Bitcoin transactions, it doesn't store the Bitcoin itself. Instead, it hosts the millions of previously mentioned wallet addresses in which Bitcoin balances are recorded. In the most simple terms, when Bitcoin is sent from Party A to Party B the transaction deducts from Party A's balance and adds to Party B's using the blockchain to verify and record the transaction. This concept is similar in nature to EFT payments in that the physical dollars are never seen and the money can still be spent after it transfers bank accounts. Nearly all money in the modern-day exists as transactional data and ever updating balances; Bitcoin remains consistent with this modern notion and is vastly more secure thanks to advances and implementations of superior encryption capabilities.

PROOF-OF-WORK, PLAIN AND SIMPLE

The Bitcoin blockchain uses the Proof-of-Work (PoW) protocol to generate new blocks and confirm new transactions. This protocol protects the blockchain from manipulation such as a 51% attack, in which a single individual would control the network's hash rate among other important features. Additionally, PoW allows the Bitcoin Network to have a decentralized distributed consensus, solving the ambient double-spending problem. Double spending has been a major issue for the fundamental ideology of cryptocurrencies, as it represents the issue with users spending the same coin more than once. Proof-of-Work is one of the more complex and technical features of the Bitcoin Network, however, the following aims at simplifying the function of this algorithm within Bitcoin and several other cryptocurrencies.

PoW works by using the computing capabilities of nodes to cross-check each block's details against each other to assure the "work" has been completed before a transaction can be confirmed; the distributed ledger feature of the network goes hand in hand with PoW's role in confirming a new transaction and its details. Thus, PoW is the mechanism that makes the blockchain immutable and makes spending the same Bitcoin more than once impossible, as it would entail the re-mining

and revision of all previous blocks. This act would require an astounding level of computing power that is unreachable by even the most powerful technological advances in modern computing. PoW coupled with DLT is what allows Bitcoin's blockchain to function without the need of a single central authority. Additionally, PoW is what allows miners to compete with each other in the race to solve the mathematical puzzles that confirm new blocks and transactions. By exhibiting the PoW protocol and confirming new transactions before the competition, Bitcoin miners receive a fee from users that further incentivizes them to continue operations; more details on this subject will be covered in the **Incentive** section. This is a simplified overview of Bitcoin's Proof-of-Work protocol and how it impacts the greater network.

INCENTIVE

Incentives play a central role in the continuation and sustainability of the Bitcoin network via new block discovery and transaction fees paid to miners discovering new blocks. Miners solve the intricate mathematical labyrinths, formally called "hash functions", necessary to extend and secure the Bitcoin Network and are rewarded with freshly minted Bitcoins as a result (a.k.a. block rewards). Block rewards are a pivotal piece of Bitcoin's scarcity and the future of its circulating supply; the role, logistics, and impact of block rewards will be covered in more detail in the **Mining, Block Reward, and the Bitcoin Halving** section. Mining incentives through block rewards has a two-fold effect as according to Satoshi, which includes (1) the network's continuation and (2) initial distribution of new Bitcoin into circulation. As previously mentioned, there is no single central authority that issues or distributes new Bitcoin as it is entirely up to the many individuals who mine the currency. This constant cycle of mining, its costs, and distribution is similar to that of gold miners who spend their resources (time, physical labor, and equipment costs) putting new gold into circulation. Much like gold miners distributing their newly mined gold, Bitcoin miners expect to sell their coins at or above the price at which they cost to mine; additional Bitcoin to gold comparisons will be produced in the **Fiat v. Bitcoin v. Gold** section.

Transaction fees also play a role in the long term financial incentive of supporting the Bitcoin Network because of the slowly diminishing block reward over time. Once the twenty-one millionth, and final, Bitcoin is mined and block rewards are completely removed, transaction fees will be the central extrinsic incentive to continue securing the Bitcoin Network. Unlike some of its counterparts, Bitcoin takes an approach to the accrual of transaction fees that require higher fees on fewer transactions; however, some other elements of the network allow this fee burden to be shared by the entire network which drastically limits the cost for a single user to transact on the blockchain. Satoshi understood that incentive is the centerpiece to the long term continuation of the Bitcoin Network and found several unique ways to implement it throughout his system.

HASHRATE

In simple terms, the hashrate of Bitcoin is the computing horsepower of the network and determines how secure the Bitcoin Network is at any point in time. In a more technical sense, hashrate is the measure of how much power is required to discover new blocks at the intended rate of one new block every ten minutes. The hashrate, or "hash power", of the Bitcoin Network is measured in "hashes/second" (h/s) and can be divisible into a variety of denominations, including kH/s (1,000 h/s). Currently, the most appropriate denomination to calculate Bitcoin hash power is TH/s (Tera Hash/second) which is the equivalent of 1,000,000 kH/s; at the time of this writing, the Bitcoin hashrate is 111.63 million TH/s, recently setting new all time highs. The hashrate goes hand-in-hand with other unique nuances of the network's functionality such as mining operations (block reward) and difficulty adjustments which are covered over the next two sections.

Understanding what influences an increase or decrease in the network's hash power can be categorized in two ways: (1) the number of miners and (2) the average efficiency of a miner actively working to secure the network. The overall hash power of the network fluctuates as miners join and vacate the network; as more miners connect to the network hash power increases and vice versa. Secondly, the average efficiency of a miner on the network has some pull in determining the network's total power, which is interdependent on other network nuances such as mining difficulty and adjustments. As indicated in the **Mining Difficulty and Difficulty Adjustments** section, miners are forced to shut down as difficulty increases and new coin production becomes more

Total Hash Rate (TH/s)

The estimated number of terahashes per second the bitcoin network is performing in the last 24 hours.



Figure 2

costly. This event has a positive subsequent impact on the average ability of a miner who persevered through the difficulty increase on the network which in turn has favorable impacts on hashrate and network security. All-in-all, the security of Bitcoin is reliant on heightened hash power, which has been steadily increasing since the digital currency's inception as indicated by the graph above produced by Blockchain.com.

The tools with which miners choose to mine Bitcoin have an influence on the individual performance of a miner. Satoshi expected that miners would use CPU's (central processing units) and GPU's (graphics processing units) to solve the complex mathematical equations required to mine Bitcoin; however, recent developments have found more efficient ways to produce higher amounts of hash power as mining difficulty quickly rises. ASIC (application-specific integrated circuit) mining has trumped CPU and GPU mining technology in that ASIC miners are built to exclusively mine Bitcoin, which allows them to operate much more efficiently and at cheaper costs. In just a short eleven years since Bitcoin's inception, advances in mining have made great strides and have helped the space and Bitcoin's hash power rapidly grow. Bitcoin mining will become increasingly more competitive as advances such as ASIC mining continue to be developed, making the network all the more robust and secure.

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MINING, BLOCK REWARD, AND THE BITCOIN HALVING

Now that some of the basic concepts surrounding Bitcoin have been explained, the aspects of the network that make it truly groundbreaking can be established. Bitcoin miners, who can be anyone with a computer and internet connection, serve a dual purpose: (1) much like the role of gold miners, Bitcoin miners must discover new Bitcoin and push them into circulation and (2) to secure and establish trust on the network by verifying transactions on the newly discovered blocks. When miners discover new blocks the network grants them "block rewards" for their work. In addition to the block reward, miners receive the fees of the transactions confirmed on the blocks which they mine. As mentioned in the **Incentive** section, miners are incentivized by the fees of transactions on the network. A single block can store any number of transactions that allow the accrued fee burden to be distributed across the many users transacting on the network, as opposed to an individual user. Aside from the transaction fees collected, block rewards received by miners for discovering new blocks play the most pivotal role in the futures of miner operations and Bitcoin's supply. Block rewards, by design, are slashed in half every four years after events called 'halvings;' although there is no proven rationale behind it, Bitcoin halvings are scheduled to occur the same years as U.S. presidential elections. This event is coveted by Bitcoin 'hodler's' (an acronym for "holding on for dear life" which characterizes those who hold the currency through its drastic price fluctuations) as it has a direct influence on the future supply of the currency. The first halving occurred in 2012 when the price of Bitcoin was approximately \$12 and the block reward was 25 Bitcoin, and again in 2016 after the block reward was further cut to its current rate of 12.5 Bitcoin/new block and the price of Bitcoin climbed from \$650 to nearly \$20,000. The next halving is set to take place in the middle of May 2020 when the block reward will be further cut to 6.25 Bitcoin. Although it's great to see Bitcoin's price dramatically climbing from halving to halving, it's critical to predict why this might be happening.

Large inflows on exchanges have historically proven to generate rallies in Bitcoin's value. As a result, the inflow and outflow metrics of Bitcoin as a market can be used as an example to analyze the effect of halvings on Bitcoin's price. The following controlled example uses a random price of Bitcoin to establish daily market buy-side and sell-side pressure using the current block reward moving into the next halving. Before getting into the numbers it is critical to understand that miners play a huge role in sell-side pressure, as, much like gold miners, it is their job to discover and sell new Bitcoin into circulation. Given the current environment of Bitcoin, 1,800 new Bitcoin (1,440 minutes per day / 10 minutes per new block = 144 new blocks per day x 12.5 BTC per Block = 1,800 New BTC/Day) are produced each day with a market rate of \$6,500; this means \$11.7 million (\$6,500 x 1,800 Bitcoin) of buy-side and sell-side pressure is required to keep Bitcoin's price stagnant at \$6,500. To see an increase in Bitcoin price, buy-side pressure would have to increase over sell-side pressure and vice versa. After the halving, however, sell pressure from miners gets slashed in half to \$5.85 million because the total daily block reward gets cut in half to 900 Bitcoin/day (\$6,500 x 900 Bitcoin = \$5.85 million). Now, only half of the previous sell-side pressure is required to be covered by Bitcoin bulls. It's important to note that aspects such as miners hoarding their newly minted Bitcoin and irregular investor activity can play a role in altering this model, nonetheless,

it provides a basic and clear glimpse of what happens to Bitcoin's supply and how it could influence price post halving. Moving forward, miners will be rewarded less and less until the last Bitcoin is mined, which is estimated to be in over one hundred years. As a result of these halving events that occur every four years, it will take an estimated forty years (the year 2100 to 2140) to mine the 21 millionth and final Bitcoin; observing trends in the network's hashrate graph also suggests the final Bitcoin will require an immense level of computing power that is not available in present times to mine. To understand what the future of Bitcoin mining holds, it's necessary to observe the current environment. As hashrate has significantly climbed since Bitcoin's inception, miners have come up with unique ways to share the difficulty and mine

Hashrate Distribution

An estimation of hashrate distribution amongst the largest mining pools.

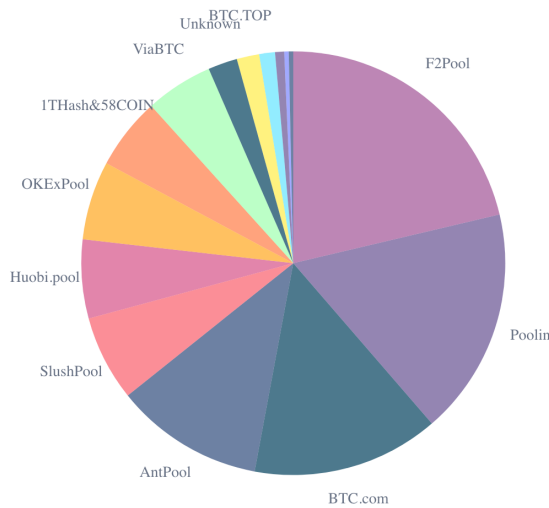


Figure 3

as efficiently as possible; the most popular tool is called a "mining pool." Mining pools are groups of miners that partner up in order to boost mining power and boost efficiency then split the rewards accordingly. Some of the most notable mining pools include players like f2pool, BTC.com, and Poolin to name a few. Mining pools will continue to grow in popularity and efficiency as it becomes more difficult for a single miner to produce new Bitcoin. The chart to the left produced by Blockchain.com highlights how the Bitcoin Network's total hash power is divided up over the last four days among mining pools. Furthermore, the decreasing block reward for miners will continue to be cut in half every four years which forces miners to gain strength and demand higher prices for their newly minted Bitcoin. All in all, the future of Bitcoin will be extremely competitive and current players will have to come up with unique ways to continue their operations. Luckily for the Bitcoin Network, it does not discriminate against who can produce the currency which allows anyone in the world to develop the next breakthrough that will be required to push Bitcoin mining to the next level.

MINING DIFFICULTY AND DIFFICULTY ADJUSTMENTS

Bitcoin mining difficulty adjustment is based on positive or negative changes in the network's hashrate and is designed to adjust every 2,016 blocks or fourteen-day period (1,440 minutes per day / 10 minutes per new block = 144 new blocks per day x 14 days = 2,016 blocks/two weeks). Bitcoin mining difficulty is readjusted to maintain the network's goal of consistently generating new Bitcoin independently of the network's overall hash power. An increase in mining difficulty makes it more difficult, and consequently more expensive, to mine a new Bitcoin while a decrease in mining difficulty makes it both easier and cheaper to create a new Bitcoin. Difficulty adjustments act as a self-correcting apparatus that adequately maintain the profit margins of those holding up the network and generating new Bitcoin. By dynamically securing miners' profit margins, there is constantly sufficient incentive for miners to continue sustaining the network. Miners are crucial to the sustainability of the Bitcoin blockchain and this unique feature embedded in the network ensures the most efficient miners are constantly incentivized to never shut down. On the flip side, when the difficulty increases, this feature picks out those miners who are operating inefficiently, which ensures only the most capable miners are holding up the network and getting rewarded for it. Costs of energy (typically electricity) heavily dictate how efficiently a miner can operate which has incentivized miners to get creative with how their rigs are powered. More conventional miners use electricity to fuel their rigs if the resource is cheap enough in his or her area; however, some miners have turned towards cheaper and renewable energy sources, such as solar and wind, with the purpose of cutting costs, boosting operational efficiency, and creating ways of generating Bitcoin in an eco-friendly way. The name of the game in Bitcoin mining is having the ability to stay afloat at all costs as difficulty adjustments aim at reducing the shock of Bitcoin value corrections on the most efficient players keeping the network alive.

The next underlying questions include how this feature influences the Bitcoin mining space and what does it mean for the various types of miners when there are fluctuations in difficulty? While the answers to these questions are theoretically simple in nature, they highlight intricate and cardinal characteristics of the Bitcoin Network that are otherwise unknown. The Bitcoin blockchain does not discriminate against who can aid in maintaining its network, thus it's important to note that miners range from entities with vast amounts of resources to college students who were able to dig up \$500 to build a node. If miners across the network find their margins are getting squeezed, those who are operating inefficiently (i.e. the college student) will be forced to shut down which has adverse effects on the overall amount of network-wide hash power. When hash decreases, the amount of resources (time and money) it takes to solve a new block increases. This has a negative effect on the network's goal of generating a new block every ten minutes and thus the difficulty must decrease to compensate for the decline in the network's mining capability. Despite some players being forced to shut down, this is

favorable for the most efficient miners who were able to maintain operations through the period of profit margin compression. Additionally, this is favorable for the overall network as inefficient players are naturally shaken out, leaving only the most capable miners to continue producing new Bitcoin. Now, the block rewards that were once allocated to the least efficient miners that shut down get redistributed to those who were not shaken out, boosting their profit margins and further incentivizing them to continue operating. Difficulty adjustments ensure that the Bitcoin Network remains as secure and powerful as possible which assists in maintaining its long term capabilities.

The chart the right shows how difficulty has been impacted by Bitcoin's past two block reward halvings. The chart produced by [@100trillionUSD](#) on Twitter offers insight into Bitcoin mining difficulty two years before and two years after each halving, also indicating where difficulty stands before the upcoming halving in May 2020.

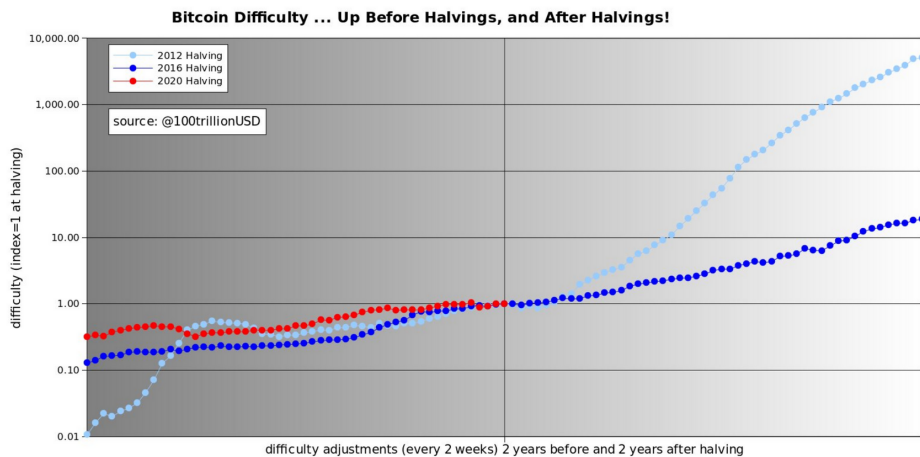


Figure 4

TRANSACTING ON THE BITCOIN NETWORK

Beginners to cryptocurrency, specifically Bitcoin, have elemental questions about how to transfer it and what to expect after transacting with Bitcoin. The process by which Bitcoin is transferred is quite simple and relies on the aforementioned public Bitcoin addresses. The first step in transacting with Bitcoin includes inputting the public address of the wallet to which the Bitcoin will be sent. Bitcoin addresses are long strings of numbers and letters that are difficult to remember, however, the implementation of QR codes facilitates this inconvenience. Users looking to transact with Bitcoin can simply scan the QR code of the destination address through the wallet which he or she is using and the address instantly appears on his or her screen. In the case of hardware wallets or digital wallets that are on devices without cameras, there is a simple copy and paste option that can be used to ensure the destination address is accurate. After establishing the destination address, users input the amount of Bitcoin he or she is looking to transact and press send. The information a user inputs when making a transaction, which includes the Bitcoin the user holds in his or her wallet, the amount which will be sent and the public address of the receiving party, is then recorded on the blockchain and awaits confirmation from miners before reaching the destination address.

Now, questions arise of when will the transferred Bitcoin arrive and how much did the transaction cost. All Bitcoin transactions require approval from the network before being confirmed, which demands confirmation by six new blocks. Transactions can take up to an hour, however, there are a couple of factors that influence confirmation time. The amount of fees paid and the amount of activity on the network play pivotal roles in this determination. As mentioned in the **Incentive** section, miners are incentivized by transaction fees and will prioritize the transactions with higher fees (some wallets let the user select how much they are willing to pay in fees which influences how long the transaction will take to confirm). The standard fee is typically negligible compared to the amount that is transacted with, but a user can raise the fee paid to prioritize his or her transaction. Secondly, if a user transacts at a time when the network is experiencing decreased activity, the confirmation will naturally occur much quicker. These are two aspects that have an impact on how quickly a user's transaction gets confirmed.

Since Bitcoin's blockchain is public anyone has access to viewing the transactions it contains. This example looks into transaction "[b36bced99cc459506ad2b3af6990920b12f6dc84f9c7ed0dd2c3703f94a4b692](#)" which was recorded in block "[625332](#)" of the Bitcoin blockchain at 3:12 PM on April 10, 2020. The long string of numbers and letters is called a "hash" which is the unique code used to identify a specific transaction on the blockchain and the block number indicates the block in which the transaction was confirmed. The hash and block number are linked with the transaction's and block's details so readers new to Bitcoin can get a view of what these details look like when recorded. This specific transaction had an input of 161,500.99966998 Bitcoin and an output of 161,500.99956979 Bitcoin, indicating that, at the time, just over \$1.114 billion was transferred for a fee of \$0.69, or 0.00010019 Bitcoin (the difference between the input value and output value). This transaction came at essentially no cost and didn't require a financial institution to be facilitated. While it's not every day that individuals are looking to transfer \$1 billion, if this user was looking to transfer the same amount of wealth through an institution, he or she would have had to pay, at the very least, the \$10 - \$25 standard wire fee charged by most institutions (1,349.27% - 3,523.19% more expensive) and waited for at least one business day. Unfortunately for this user, he or she decided to transact on a Friday less than an hour before banks closed and would have had to wait at least seventy-two more hours till the next business day for funds to transfer; Bitcoin fixes this.

VALUING BITCOIN

Since Bitcoin reached its all-time high of \$19,891 in December 2017, enthusiasts have called for a single Bitcoin to be worth \$100,000 or more; an approximate 1,328.57% increase in value using its current price of \$7,050.00. While this estimate sounds excessive, there are a couple of conventional ways of valuing Bitcoin. Such valuation methods include the stock-to-flow model and the use of Metcalfe's Law. Before getting into the details of these valuation methods, it's important to mention the other side of the Bitcoin valuation debate and include why some believe Bitcoin will never reach its all-time high of just under \$20,000 again. The primary argument for these individuals, including world-famous investor Warren Buffet, lies in that they believe Bitcoin has no intrinsic value, or "the value of an asset using complex formulas or objective calculations" and can therefore not be a rational currency or store of value. Despite some believing Bitcoin has no value and is merely a bubble, there are simple reasons to believe this is not true. By nature, Bitcoin is scarce and has the utility of serving as a superior method of transferring wealth, which are two characteristics of an asset simple economics assigns value to. Moreover, the same argument about lacking intrinsic value can be made about the U.S. Dollar. For example, according to the Federal Reserve's website, it costs roughly \$0.16 to print a five-dollar bill, thus the remaining \$4.84 after production costs rely on the trust of users to perceive that a five-dollar bill, is indeed, worth \$5.00. Instead, Bitcoin users trust the underlying algorithm which utilizes consistent and established rules to run the network. After drawing such a comparison, it can be concluded that Bitcoin has measurable value.

The stock-to-flow model (S2F) is a popular valuation model followed by the Bitcoin community. This model, which is commonly used to value scarce resources like gold, was brought to mainstream use for cryptocurrencies by the anonymous [@100trillionUSD](#). The S2F model looks at Bitcoin like other scarce "store of value" commodities that hold value because of their limited supplies. This model compares the current supply of an asset to the future flow of new units, or in this case newly mined Bitcoin, and is calculated dividing current stock by future flow (S2F = Stock / Flow). Halving events slash Bitcoin's flow in half every four years, thus its S2F ratio effectively doubles after they occur. An increasing S2F ratio stipulates that a commodity is increasingly

scarce, and thus makes it more attractive to those looking to store value in it. The chart to the right produced by [@100trillionUSD](#) indicates that Bitcoin's value has a high correlation with this model (r^2 of .95) and highlights halving events' impact on value. Bitcoin's value holds a high correlation with this model because of its fixed supply and slowly decreasing number of new units that will be produced over time. Breaking down the chart, the red dots indicate actual BTC/USD value and the grey line indicates where the S2F model estimates Bitcoin's USD price should be. The steep inclines in the S2F model indicate where Bitcoin halvings have occurred, with the next halving approaching in in the first weeks of May.

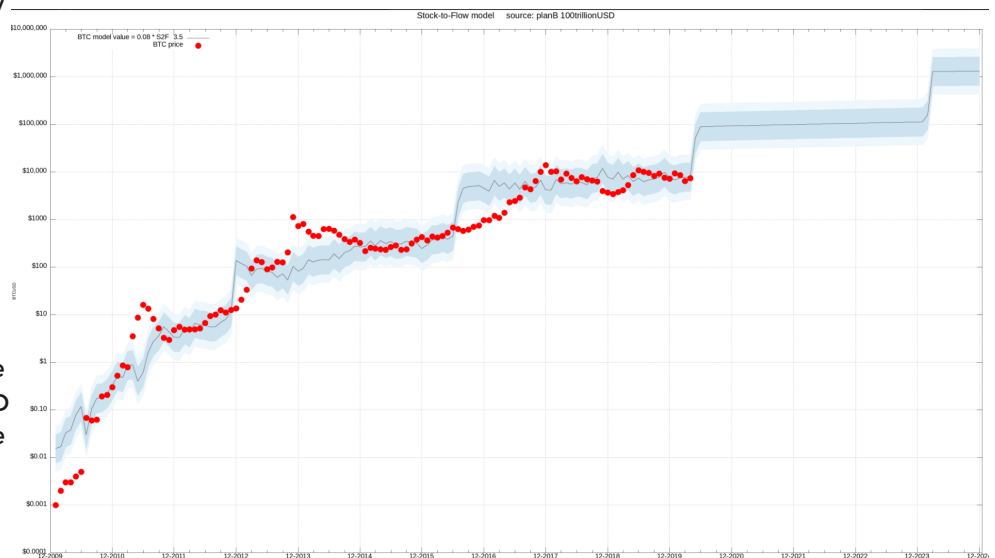


Figure 5

Additionally, the blue bands around the S2F line indicate where Bitcoin is overvalued or undervalued relative to the model.

Metcalfe's Law is another popular method used by the community to value Bitcoin and was commonly used by analysts to value Facebook and Google in their stages of infancy. This law states that a network's impact, or value, is equal to its number of users squared ($V = n^2$). Nodes are considered users in the case of Bitcoin with an estimated ten thousand plus of them actively supporting the network. After squaring the number of active nodes, analysts then divide that value by the number of coins in circulation to calculate the value of a single Bitcoin. This law highlights that as more computers begin joining the Bitcoin Network the impact it has grows exponentially. Couple this notion with the fact that Bitcoin's circulating supply will grow at increasingly slower rates as time passes and massive macro gains in value become more apparent. Despite the harsh criticism, Bitcoin still holds value that analysts have found traditional ways to measure.

"Instead, Bitcoin users trust the underlying algorithm which utilizes consistent and established rules to run the network."

WHAT IS BITCOIN?

While the Bitcoin Network seems like an entanglement of highly technical computer science theories, it captures simple economic principles that are critical to hard money and sovereign stores of value. The technical intricacies that make up the network allow it to be the first exclusively digital form of money that is sound, immutable, and decentralized. Coupling such characteristics, Bitcoin allows for the next stage of the digital revolution to have more of a positive influence on humanity than any of its technological predecessors. Given this new understanding of the digital currency and its network, the question of what is Bitcoin? should be asked and answered again:

Bitcoin is **sound money** because of its algorithmically limited supply, high level of divisibility, and adherence to simple economic principles.

Bitcoin is **immutable money** in that its transactions cannot be reversed or amended and it is impossible to counterfeit or copy.

Most importantly, Bitcoin is **decentralized money** that does not rely on the trust of a financial institution or the need for a central government's influence to function.

PART II: FIAT CURRENCIES AND THE ALMIGHTY DOLLAR

WHAT IS A FIAT CURRENCY?

A fiat currency is any government-issued currency that is not pegged to a physical commodity, such as gold or silver but is rather backed by the underlying guarantor (i.e. the issuing government). Since fiat currencies are not backed by a physical commodity, their values are procured through the stability of the issuing government and supply/demand economics. Many current global paper currencies are fiat currencies, including the U.S. Dollar which gained its fiat currency status in 1971 after Former President Nixon took the dollar off of the gold standard. Fiat currencies give the issuing countries' central banks heightened control over the economy as they have a monopoly over currency production. This is a primary danger of fiat currencies as governments can easily print too much and create hyperinflation, which has been the unfortunate case for twenty-five countries since 1984. This is the general makeup of most current global currencies, including the premier global reserve currency, the U.S. Dollar.

HISTORY OF THE U.S. DOLLAR

FUNDAMENTAL HISTORY: FROM THEN TO NOW

A USD equivalent in the United States can be found as early as the Revolutionary War when colonists used the "Continental Currency." This currency was heavily regulated and restricted by British Parliament, but was nonetheless used by colonists as a medium of exchange for the thirteen colonies. After the colonists had gained independence from the British, it became apparent that there were several flaws with this currency, including a lack of financial backing and counterfeiting. In response to the apparent imperfections with the Continental Currency, Congress chartered the nation's first National Bank in Philadelphia and the U.S. Dollar was deemed the standard monetary unit of the United States of America in 1785. Seven years later Congress passed the Coinage Act (Mint Act) of 1792 which assisted in organizing a structured monetary system by establishing the U.S. Mint in Washington D.C. which regulated the coinage of the United States. The formation of the U.S. Mint patched some of the central issues with the former Continental Currency, including the problem of counterfeiting. Less than a hundred years later in 1863, Congress initiated a revised national banking system that offered the U.S. Treasury the

power to supervise the issuance of National Bank notes. The intention of this revision was to give national banks the liberty of distributing money and purchasing bonds all while remaining regulated.

Decades later in 1913 Congress passed the Federal Reserve Act which formed a single central bank with the responsibility of maintaining a national banking system that kept up with the commanding and dynamic financial requirements of the country; thus the current Federal Reserve System (the Fed) was created to superintend monetary policy. It should be noted that this act was signed into law for the purpose of creating national financial stability after the Panic of 1907 and gave the Federal Reserve ultimate power in supervising banks and implementing monetary policy. Interestingly enough, the Federal Income Tax was introduced in the same year as the Fed's formation. Beyond 1913 there have been several important events that directly affected the modern U.S. Dollar which includes but is not limited to the 1944 Bretton Woods Agreement, the declaration of the U.S. Dollar as the global reserve currency in 1945, and President Nixon's removal of the gold standard in 1971.

More recently the U.S. Dollar has seen a deflated value because of the current administration's choice in fiscal policy. However, the reality of deflated values of currencies is becoming all too common globally. The following highlights rate cuts made by some large countries who have been easing their economies over the past year:

- U.S. Fed: 125 bps
- China: 26 bps
- India: 135 bps
- Russia: 175 bps
- European Central Bank: 10 bps

In the case of the United States, the primary goal of a deflated Dollar is to assist in reversing trade imbalance which has been a prioritized objective of the current administration. Globally, however, there are a variety of reasons why nations, including the United States, want to devalue their currencies; the chief reason being to reduce the impact of sovereign debt burdens. It is estimated that global debt will reach upwards of \$260 trillion after Q1 2020, an approximate 6% increase from the global debt total of \$246.5 trillion in 2019. Governments worldwide have abused the ability to issue sovereign debt in order to grow at unprecedented rates, with some world superpowers now having debt to GDP ratios over 100% plus and growing; Japan has the most debt compared to GDP at 237% compared to the United States' approximate 107% in 2019. Aside from the devaluation of the U.S. Dollar and ever rising debt being experienced today, the weaponization of the USD over recent years has had global financial impacts. Powerful global figures, including Vladimir Putin (Russian President), have made comments on this matter; at a Russian forum at the end of 2019, President Putin stated that the current use of USD as a weapon is a mistake that is being undermined by the current administration. Putin was directly quoted saying the following:

"We see attempts of using the dollar as the political error. I believe this is one more major mistake, because the dollar enjoyed a lot of confidence globally. This was actually the only universal global currency. The United States started using dollar settlements as a tool in the political struggle for some purpose, imposing restrictions on dollar use and cutting the branch they are sitting on but they will fall with a crash soon."

- Vladimir Putin (Russian Energy Week Forum, 2019)

The United States currently has sanctions against thirty countries which creates massive economic strains for these nations. One specific example is the sanction held against Iran which is denying the country its right to the U.S. Dollars it has saved in the United States Federal Reserve. The issue of granting Iran its right to the cash is a polarizing political topic that has been argued as recently as February of 2020 but is nonetheless a prime example of how the United States is currently using its strength and currency as a weapon. To assist in circumventing the negative economic impacts of these sanctions, the Iranian government issued licenses to one thousand crypto mining companies. [Crypto mining is now considered an industrial activity in Iran which it will use to accelerate trade while importing foreign currencies to avoid the sanctions.](#) While it is unlikely, and extremely unfavorable, for the U.S. Dollar to experience a complete collapse as outlined by Vladimir Putin, there is no question that many countries have, and will continue, to question the conviction of the world's most premier currency as it is continually used in such a manner. The current fundamental environment of unprecedented and quickly growing levels of global debt, devalued currencies globally, and the weaponization of USD, in addition to powerful global leaders pointing out such issues will become increasingly problematic, hints that a shift in global finances is on the horizon.

The following brief analysis will use 1913 as the primary benchmark year, as it indicates the point at which the Federal Reserve took control of the greater U.S. Banking System. As indicated by the Bureau of Labor Statistics consumer price index (CPI), prices in 2020 are approximately 2,500% higher than they were after the Fed's inception in 1913; this means an item that costs \$1.00 in 1913 now costs nearly \$26.00. The decrease in value, or purchasing power, of the U.S. Dollar over this 107 year period is due in part to inflation caused by expansive monetary policy (i.e. printing more money). Using the above information gathered from the Bureau of Labor Statistics, it can be inferred that \$1 in 1913 is now worth approximately \$0.04, a near 96% decrease in USD purchasing power (**average of 3.09% inflation/year**). To those who haven't been able to live through events where inflation was highly noticeable, such as Former President Nixon's removal of the Gold Standard in the 1970s, inflation hasn't been as immediately apparent. Needless to say, it should be noted that inflation has had a significant impact on purchasing power as there has been a steady devaluation of the world's premier currency over the last 107 years. This situation doesn't appear to be getting better, either, as the Federal Reserve has printed additional USD totaling an approximate \$2.3 trillion from February 10 to April 28, expanding its balance sheet by 57.15% less than ninety days. The chart below produced by howmuch.net highlights how USD has been devalued since the Fed's inception and includes when important events directly effected the U.S. Dollar's purchasing power.

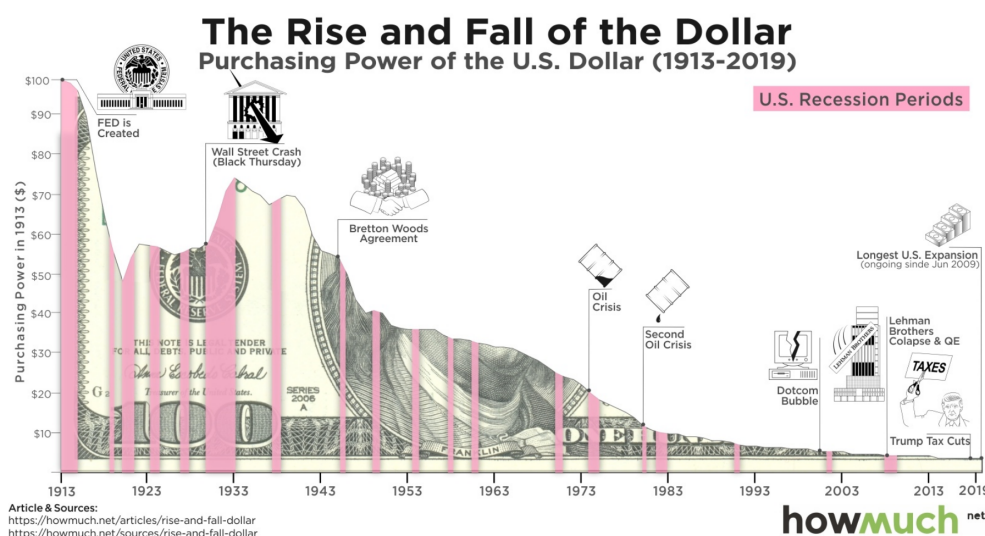


Figure 6

PART III: BITCOIN, FIAT, GOLD

COMPARISON

FIAT V. BITCOIN V. GOLD

This serves as the perfect moment to circle back to the aforementioned comparisons made between Bitcoin and gold, and include some key similarities and differences between Bitcoin and Fiat. Aside from the obvious differences such as the tangibility of USD and gold and the digital characterization of Bitcoin, there are several key differences and similarities that can now be established. The chief differences between Bitcoin, gold, and fiat in general rest in the following:

Production: One key difference between Bitcoin and fiat currencies, which is a critical similarity between Bitcoin and gold, includes how and by whom each is produced and how new units enter circulation. In the case of fiat, production is monopolized by central banks who determine where a currency's supply should be; citizens of the state have neither say in when or how much of their currency is produced, nor have the ability to create dollars themselves. Fiat currencies are

then injected into the economy via central banks who purchase assets or make loans to smaller banks to raise the circulating supply. Bitcoin functions differently in this respect. Like gold, Bitcoin can be mined by anyone who has the resources to do so efficiently enough to operate in profit. Miners of both Bitcoin and gold then inject new units into circulation by selling to those who demand them. The key difference between gold and Bitcoin in this respect is a fixed amount of Bitcoin is produced each year while gold's new production is more unpredictable. Secondly, the amount of new Bitcoin produced each year decreases as more halving events occur, while gold's year to year production has been historically increasing; this makes Bitcoin more scarce over time and allows its future circulating supply to be highly calculable. Lastly, Bitcoin's production allows contributors to be directly rewarded for the "work" they complete which strengthens and builds up the network. This liberty removes the need for a central authority, such as a central bank, to dictate an entity's money production/supply demands.

Supply and Scarcity: Another critical difference between Bitcoin and fiat is supply and scarcity. There will only ever be twenty-one million Bitcoin in circulation and there are no exceptions to this rule. The abundant supply of anything, according to simple supply/demand economics taught in Econ101 classes, has negative effects on value. This is especially relevant in modern times where the Federal Reserve is making mention of "unlimited liquidity" which would make U.S. Dollars effectively worthless; $1/\infty = 0$ and $1 \text{ billion}/\infty$ is still 0. As said by Charles Wheelan in his book 'Naked Economics', "there is a finite supply of everything worth owning," (Chapter 1, Page 6) because simple supply/demand economics proves that once supply is topped out demand will drive value. This is attractive for Bitcoin because even if 10% of the world's 7.5 billion population ends up demanding it, that leaves 21 million bitcoin for 750 million people or .028 BTC/person. Gold is better positioned than fiat in respect to supply because it is a scarce resource, however, it is unknown just how scarce it is. This is where Bitcoin has an advantage over gold, Bitcoin's supply is fixed while it is unknown how much gold is in existence. Supply was the major focus of Satoshi when creating the Bitcoin Network and is a characteristic that makes Bitcoin the most "sound money" in existence and sets it apart from assets such as gold and fiat.

Divisibility: It is critical that currency is divisible enough to be conveniently used when exchanging for any type of good. Divisibility is a characteristic where Bitcoin trumps all other mediums of exchange as it can be broken down into a single Satoshi or 1/10,000,000 of a single Bitcoin. This level of divisibility allows Bitcoin to be easily transacted with and not require the use of needing "change." Looking at the U.S. Dollar, for example, the lowest denomination is \$.01, or 1/100 of a single Dollar, which is why most transactions used with physical dollars require change. This characteristic of Bitcoin is what allows the network to handle many transactions at a single time and is what makes Bitcoin so simple to use when making an exchange. Like Bitcoin, gold can also be denominated from ounces to micrograms, and so on, if it absolutely has to be. Unfortunately, this can't be accomplished without a pickaxe and a scale which is barbaric for the modern age. Bitcoin's great level of divisibility makes it far more convenient to transact with and sets it apart as a medium of exchange.

Double Spending and Counterfeitability: One critical characteristic of fiat currencies is that they can't be double-spent; after a physical dollar has exchanged hands it cannot be re-spent by the same person ever again. Double-spending has been a popular critique of cryptocurrencies as some of them have the problem of users gaining the ability to essentially copy and paste more of them into their wallets. While this is an issue for some cryptocurrencies, this is not an issue for Bitcoin. Thanks to the Proof-of-Work protocol, it is ensured that after a user transacts with his or her Bitcoin it can never be spent by him or her again. For example, a user has 1 Bitcoin that can be spent on Item A or Item B but doesn't have enough Bitcoin to afford both. Despite acknowledging this, the user buys both items simultaneously anyway and thinks that both items are now under the user's ownership; however, this is not true. In this event, both transactions would be pending confirmation by the network and the one that gets confirmed first would be printed to the blockchain (the Bitcoin for that item would also be removed from the user's wallet) and the other would be invalidated because of insufficient funds and the Bitcoin spent would return to the user's wallet. In the event that both transactions enter the unconfirmed pool and get confirmed simultaneously, the transaction that receives the most confirmations would be validated and the other would be unapproved by the network. The confirmations that must occur to validate these transactions function using the PoW protocol, as mentioned in the Proof-of-Work, Plain and Simple section. This algorithm is what disallows any single Satoshi being spent more than one time. This is one characteristic of fiat that is critical to any medium of exchange and is what makes Bitcoin unique as a digital P2P cash system.

Counterfeitability is a common issue with both USD and gold that is essentially impossible to achieve with Bitcoin. As indicated by the United States Department of Treasury, there is an estimated \$70 million in active counterfeit bills in circulation. Security strips and other measures have been taken to make the production of fake Dollar Bills more difficult, however, some scammers have gotten quite good at their jobs. Moreover, history is littered with fake gold scandals as scammers have been caught wrapping gold plates around solid bars of tungsten or other metals. While this is a problem with mediums of exchange such as gold and fiat, Bitcoin's PoW mechanism prohibits new coins from being counterfeited.

Decentralized: The most important distinction that can be made between Bitcoin and fiat currencies is Bitcoin's decentralized nature. The many intricacies of the Bitcoin Network that have been outlined throughout this research piece allow it to exist as a valid medium of exchange without the need for a central authority to maintain trust or influence it. As stated by Janet Yellen, "the Federal Reserve simply does not have authority to supervise or regulate [B]itcoin in any way," concluding "It's not so easy to regulate Bitcoin because there's no central issuer or network operator." These statements were made six years ago by the former Chair of the U.S. Federal Reserve and still stands true today. No single government can use its power to impact the day to day functionality of the network itself. New Bitcoin will continue to be mined every ten minutes and transactions will continue to be verified using distributed trust independent of the need for a central authority, just as Satoshi Nakamoto intended it to be. As a result, Bitcoin advocates across the globe have flocked to the digital currency because of the impossibility of state-run governance over the network. The decentralized nature of Bitcoin is what truly sets it apart from fiat and gold and is the primary driver of the difference it has and will continue to make as society enters the next stages of its digital revolution.

These are just a couple of ways in which Bitcoin, gold, and fiat, compare to each other. Other notable comparisons that can be drawn include portability, durability, and programmability. Bitcoins do not exist as tangible items which makes it the most portable currency in existence. Fiat also boasts a high level of portability, while gold is burdensome and heavy to carry around. Moreover, Bitcoins are highly durable and cannot be destroyed. Although they can be lost if a user misplaces a wallet's keys, Bitcoin can never be "deleted" from the network. Lastly, Bitcoin is the only form of programmable money that exists in the tech-driven era of humanity. Bitcoin is 'smart' money whose entire ecosystem exists on a network. Unlike gold and fiat, who still exist as physical entities. While this list can go on forever, the preceding characteristics are some of the more important comparisons that can be drawn regarding the world's most premier mediums of exchange and Bitcoin.

“the Federal Reserve simply does not have authority to supervise or regulate [B]itcoin in any way”

- Janet Yellen (Former Chairman of the Federal Reserve)

BITCOIN'S PLACE IN A FIAT DOMINATED WORLD

The need for digital currency like Bitcoin in a world dominated by fiat currencies like the U.S. Dollar is a hotly debated topic amongst Bitcoin maximalists and fiat enthusiasts. While each side holds valid claims, it's important to observe the facts that each assertion is established on. The following outlines a couple of many facts that serve as the primary premises for both pro-Bitcoin and pro-fiat arguments which cast some light on how Bitcoin can find its place in a world that is otherwise dominated by government-issued currencies.

First, it's essential to note that living in the United States and having the ability to naturally own and earn U.S. Dollars is a real privilege. Unlike life for those living in many countries around the world, Americans live in a system that, while fragile, works to protect the interests and well-being of its citizens and uses a currency that is accepted anywhere in the world. In some cases, governments around the world restrict the financial freedoms of its citizens. While Bitcoin isn't the sole cure in this situation, it still gives the underrepresented portion of the world's population exposure to owning money that cannot be confiscated or controlled by a central government. This is a serious issue that is faced by hundreds of millions, if not billions, of people worldwide and is something Bitcoin aims at fixing. "Banking the unbanked" is a popular term coined by Bitcoin enthusiasts who understand the impact Bitcoin can have on individuals whose governments lack the resources to develop a reasonable financial system or choose to limit the financial well-being of their citizens.

Next, individuals who are pro-Bitcoin argue that cryptocurrencies are the next step in the world's digital revolution. Banks' uses of accounting for fiat transactions utilizing digital interfaces highlight that technology is already having heavy influences on the financial system, however, such advances have already been outdated. How fiat currencies across the globe are accounted for mirrors how crypto transactions are tracked, needless to say, such tracking of fiat requires the use of a bank that has unlimited power in handling and monitoring a user's holdings and history. Additionally, bank accounts come with hefty charges that are nonexistent with Bitcoin. Banks can charge overdraft and maintenance fees and profit off of individuals who don't hold minimums in their accounts. In 2017 it was recorded that Americans paid over \$34 billion

in overdraft fees, meaning banks made \$34 billion in collective profit off of account holders who didn't have enough money to meet the minimum balance. Although overdrafts could be a result of poor spending habits by account holders, the issue lies in that banks are profiting off of account holders for not being able to hold enough cash in their accounts. Additionally, some institutions charge checking account fees that are due each month. For example, a "Regular Checking" account with Citibank costs account holders between \$10 and \$30 per month, or \$120 to \$360 per year. This is a concept that digital currency enthusiasts feel is outdated and doesn't make sense in a world where more and more people are struggling to keep money in their accounts. The Bitcoin Network charges no such fees to create or maintain a wallet, as it is entirely free to use and store value on the network.

While it has been noted that Bitcoin can solve several financial problems faced by billions of people worldwide and is the next step in the digital revolution, there are a couple of hurdles it must jump before its full potential is tapped. Such hurdles include, but are not limited to, the development of the necessary infrastructure in countries that are otherwise grossly underdeveloped and the need to significantly lessen its current level of price volatility. Iconic individuals in the crypto space have created projects and goals that include bringing the necessary infrastructure to countries in Africa that don't even have the "basic" infrastructure, such as wifi or computers, needed for digital currencies to be usable. Not only would the successful development of the needed infrastructure in these African countries give people new opportunities at building and transferring wealth, but it would introduce Bitcoin to just over one billion people (approximately 14% of the world's population). Doing so would also grant a massive amount of people the ability to have technology, such as computers and the internet, that they have been unable to own since technology became prominent. The problems Bitcoin solves, in this case, come with even bigger price tags as many of these countries would need millions in infrastructure.

A reason why fiat is currently more acceptable as a medium of exchange includes its "stable" value. When two parties exchange U.S. Dollars it can be strongly assumed that the same dollar can purchase another good of equal value at some point in the future; this is unfortunately not the case with Bitcoin. Bitcoin's price is highly volatile and can change drastically on a day to day basis which makes it a less desirable medium of exchange. Few people would be willing to accept 1 Bitcoin for their product if that same Bitcoin will be worth 10% less the following day, which is both logical and understandable. Despite the price volatility of Bitcoin offering unique opportunities for investors, it disallows it from becoming a more widely used tender that replaces paper money. Many enthusiasts believe the volatility layer that currently exists around the currency will diminish over time, but recent price action and fundamental drivers of the digital currency suggest that the volatility is here to stay for a while.

It can be concluded that Bitcoin does not require the complete collapse of the U.S. Dollar, or fiat in general, to become a widely used global medium of exchange. Only extreme Bitcoin maximalists desire the collapse of fiat as a whole in order to more quickly usher in the era of digital currencies, however, this is unreasonable. The collapse of fiat currencies and the U.S. Dollar would equate to economic devastation that could not be solved by simply subbing in digital currencies for fiat. Instead, those who hold a strong understanding of global finances know that Bitcoin could simply be another currency and store of value option for those who demand it or need it. The argument of whether or not Bitcoin and fiat can function in unison is polarizing, however, the current relationship and flow between these currencies suggest that the continuation of one over the other is not reliant on the other's demise. The last ten years suggest that a global financial system in which fiat and Bitcoin operate side by side is not unreasonable and has proven to have an onslaught of positive effects for individuals globally.

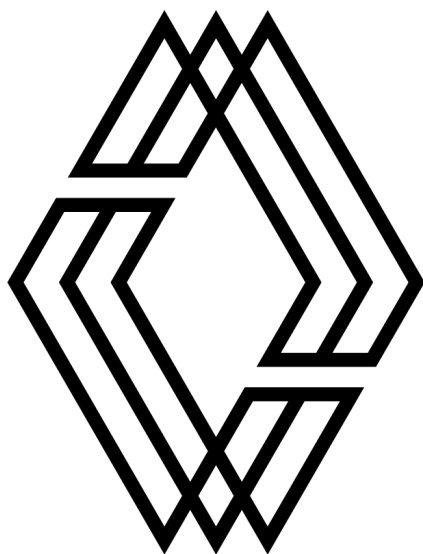
CLOSING STATEMENTS

Boasting a market capitalization of over \$130 billion and growing, Bitcoin has found its tranche in global finances and will continue to dig deeper as the budding asset class continues to mature. Bitcoin is the centerpiece of a large digital ecosystem that is beginning to leave its mark on society. The current social environment is primed for the changes that Bitcoin and its peers will bring, as society today is more connected than ever. Despite the great influence technology has already made on society socially, Bitcoin serves as the key that unlocks the next stage of digital human connection. The modern social environment has few barriers restricting humans from instantly connecting; however, the current system inherently impedes financial communication. Bitcoin allows users from anywhere in the world to transact with each other in a rapid and cost-effective way that is currently unobservable in the current global financial environment. Bitcoin's ability to financially connect billions of people instantly is why its technology will prove to be more impactful as time passes and humans require heightened levels of financial connectivity.

Aside from the positive social changes Bitcoin creates, it solves some key issues faced by the global financial realm. While fiat currencies are essential to the world's financial engine, they have several observable holes that Bitcoin aims at filling. Bitcoin fills these holes by being (1) decentralized (2) scarce and (3) having a fixed supply. The relationship between Bitcoin and fiat currencies proves the demise of the traditional system is not needed for Bitcoin to continue functioning. Instead, Bitcoin, its hodlers, and those building in the blockchain space will push forward resiliently as the world undergoes unimaginable changes moving through the coming decade.

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