Bitcoin: Future or Fad?

Tut, Daniel

Ted Rogers School of Management- Toronto Metropolitan University

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Daniel Tut*

Ted Rogers School of Management: Toronto Metropolitan University

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Abstract

Is Bitcoin the payment system of the future? This chapter argues that Bitcoin is neither a currency nor gold, but that it is a tradable asset and an alternative form of investment. Bitcoin also exhibits some features as an investment asset that are similar to collectibles. The true value of Bitcoin lies not in its speculative nature but in the embedded technology which has the long-term potential of revolutionizing traditional finance. Blockchain technology can provide solutions to Big Data challenges and provide an off-ramp during political uncertainty. Bitcoin's long-term survivability and viability as an asset will largely depend on its diversification role, institutional adoption, tax treatment and regulations.

Keywords: Bitcoin, Cryptocurrency, Blockchain technology, smart contracts, digital assets, NFTs, Payment Systems, Money, stablecoins, non-fungible, ethereum

*Email: dtut@ryerson.ca. This work is partially based on a lecture on ***"Cryptocurrencies and Blockchain Technology"*** given at the Ted Rogers School of Management as part of a course on ***Financial Intermediation.*** The notes are for a wider consumption and are partly inspired by a rather elegant question posed by Tyler Mathisen on CNBC: ***"What the hell is Bitcoin?"***

1 Introduction

"When I look at Bitcoin, I can't decide whether it is a commodity, a currency, an investment, a collectible, a cash proxy- What the hell is it? And where, if anywhere, does it fit in a normal person's portfolio? And I am not suggesting that people that have Bitcoins are abnormal in any way!" Tyler Mathisen- 16/2/21.

Despite the worldwide attention that Bitcoin (and cryptocurrencies in general) has garnered, there are still significant uncertainties regarding the nature and the role of Bitcoin in an individual's portfolio. This chapter examines whether Bitcoin is a commodity, a currency, an investment, a collectible, a store of value, or a cash proxy and its potential role in a regular person's portfolio. It also discusses how the Blockchain technology underpinning Bitcoin's protocol can be used to address some of the challenges in Big Data.

Bitcoin is a digital currency that uses a Blockchain protocol in which digital signatures are cryptographically validated via timestamp, independent of a financial intermediary. A hash function that links transactions of any arbitrary size to a fixed value size is used to chain the timestamped blocks together. A hashcash proof-of-work (PoW) algorithm validates all transactions and blocks, creating a verifiable distributed timestamp digital ledger[1][2].The Blockchain technology underlying Bitcoin's protocol has a potentially wide range of applications and has been used to create new digital assets. Blockchain technology also has the potential to address some of the challenges underlying Big Data. The

[1]See Nakamoto (2008), for detailed discussions on Bitcoin's protocol.

[2]Note that node operators or "miners" are incentivized and rewarded in Bitcoin for every successfully validated block in the chain. This ensures continuity of the Blockchain.

challenges in managing, collating and storing Big Data arises due to size, frequency, complexity, data breaches and computational needs. Blockchain technology can be used to create immutable protocols which minimizes malicious attacks and fraudulent activities. And due to the decentralized nature of blockchain protocols, users can have control rights over their private data independent of any third-party. In this chapter, we provide some evidence as to how Blockchain technology can be used to address some of the Big Data challenges in the healthcare sector, in the global supply chains and in the control over access and use of private data.

Bitcoin's initial goal was to be a peer-to-peer electronic cash, a potential replacement and an alternative to fiat currency. However, this chapter demonstrates that Bitcoin fails to function as an effective unit of account since in a universe in which cash exists, transacting parties will always revert to using cash over Bitcoin. Bitcoin has lower scalability and higher transaction costs relative to alternative payment processes such as credit cards. Further, because of to its inherent price volatility, Bitcoin does not fair better than gold as a store of value, inflation-hedge and as a currency hedge. Bitcoin has a high Sharpe ratio and its speculative nature can provide for some alpha opportunities for institutional investors and hedge funds. But given its speculative nature, it is not clear yet what role Bitcoin can serve in a regular person's portfolio.

Using monthly data obtained from Coinmarketcap.com, Federal Reserve Bank St. Louis (FRED) and Yahoo finance for the period 2009-2022, we conclude that Bitcoin is neither gold nor currency, but that it is a tradable asset and an alternative form of investment. Bitcoin also exhibit some features as an investment asset that are similar to collectibles. The true value of bitcoin lies not in its speculative price appreciation but in the embedded technology (Blockchain, Defi and Distributed Ledger Technologies) which has the long-term potential of

revolutionizing traditional finance. Bitcoin's long-term survivability and viability as an asset will largely depend on its diversification role, tax treatment and government regulations.

The rest of this chapter is organized as follows. Section 2 examines whether Bitcoin is the future of payment systems and section 3 concludes and discusses whether Blockchain technology can address some of the challenges in Big Data and the potential impact of regulations on cryptocurrency space.

2 Is Bitcoin the Future of Payment Systems?

2.1 Bitcoin as a Cash Proxy

Is Bitcoin "money"? Bitcoin was originally intended to be a "purely peer-to-peer (p2p) version of electronic cash...allow online payments to be sent directly from one party to another without going through a financial institution...[and] a solution to the double-spending problem using a peer-to-peer network" (Nakamoto, 2008). In order to understand whether Bitcoin can actually function as "money", we need to examine whether it satisfies and meets the criteria for an item or for an object to be considered as such. There are four such attributes of money[3]: [1] Medium of Exchange [2] Method of Payment [3] Unit of account and [4] A store of Value.

Bitcoin meets the first two criteria as the Bitcoin protocol allows for transactions using BTC which is the smallest tradable unit of Bitcoin to be transferred from one account to another. New transactions are communicated to nodes, each node then collects all transactions into blocks, once a node finds a proof-of-work (PoW) the block is then communicated to all nodes. The block is only accepted if transactions are verified as

[3]See Smithin (2002), Davies (2010)

having not been already spent. Once transactions are verified and validated, the nodes start working on creating and adding a new block to the chain. Transactions are only considered valid only after they are verified through a community consensus, that is by the majority of the network nodes (Song & Aste 2020, Akcora et al., 2018). The network rejects any transaction whose referenced output does not exist or has already been spent; such a transaction is not included in the Blockchain. In the creation of the block, a transaction is only added into the wallet if the sum of block creation fee and transactions fees are greater than the coin base value. Matching transactions are then deleted from the pool before the block is relayed to peers and added as part of the main branch in the chain via a Merkle tree. Effectively, Bitcoin eliminates double-spending via the use of digital signature algorithm, and proof-of-work via hash function which provide some security and allows users to engage in exchanges (Lipton & Trecanni, 2021). Thus, Bitcoin can serve as a medium of exchange and a method of payment (Yermack, 2013). Indeed, Figure [1] shows that the price, volume and market capitalization reflecting the demand and interest in Bitcoin.

[INSERT FIGURE 1 & FIGURE 2 ABOUT HERE]

However, Bitcoin, at best, partially meets the third criteria: "Unit of account". In order for Bitcoin to be a stable and effective unit of account, transacting parties should be able to price goods in Bitcoins. The daily fluctuations in Bitcoin prices, as shown in Figure (2), suggests that it might neither be in the best interest of the buyer nor the seller if goods are priced in Bitcoins. For example, consider a one-time transaction between a buyer and a seller. If the value of Bitcoin is precipitously falling, the buyer might be willing to exchange their Bitcoin holdings for a basket of goods while the seller will be unwilling to accept Bitcoin as a form of payment. And if the value of Bitcoin is on the rise, then buyers will find it

difficult to depart with their Bitcoin holdings yet this is precisely the time during which sellers are more than willing to accept and priced goods in Bitcoin.

This simple example illustrates that transactions are likely to be incomplete when goods are priced in Bitcoin. The inefficiency in transactions using Bitcoin becomes even more apparent when we consider issues in the labor markets (wages) and in the financial markets (earning reports). Because of this inefficiency, it is difficult to make forward-looking valuation and to engage in future contracts when goods are priced in Bitcoin. Relative to alternative forms of payment, such as cash and credit cards, Bitcoin has higher transaction costs, as mining of tokens is costly and users have to utilize exchanges to receive tokens before engaging in any transactions (Thum, 2018, Stoll et al., 2019). The exchanges, such as Coinbase and Binance.US serve as trusted third-party in the network. Additionally, each BTC block is limited to 1MB size and cannot handle more than eight transactions per second[4]. This limits the scalability and wider adoption of Bitcoin as a form on payment on a global scale[5]. As a result, in a universe in which cash exists, rational employers and employees will always revert to using cash over Bitcoin.

2.1.1 Stablecoins

One potential solution to the volatility of Bitcoin as a currency is the advent of stablecoins. Stablecoins are digital currencies whose value is pegged to a fiat currency (US dollars) or a basket of currencies. The aim is to use Blockchain technology to create a stable, cryptographically secured coin similar to fiat currency that will reduce volatility for

[4]Credit cards such as Visa can process about 20,000 transactions per second with significant less energy consumption per transaction.

[5]The updated BSV 1.0.7 (released, 2021) has no block size limit and the protocol can handle scalable transactions but it is not yet clear whether this will lead to scalability at the global level (MNP, 2021).

investors in the cryptocurrency market. Stablecoins are, therefore, particularly useful for those investors who want to redeem or exit their positions in the market. In order to peg a stablecoin to a fiat currency, the coin can either be backed by cash-equivalent reserves such as Treasury bills or backed by a smart-contract on the blockchain. The smart-contract ensure that the peg holds by buying or selling the required number of coins once pre-set conditions are met[6]. Figure (3 & 4) shows that while Tether coin experienced noticeable volatility, it has nevertheless been stable over recent years. While on average the value of Tether is highly correlated with the value of US dollar; the volume is highly dependent on Bitcoin. The correlation between Tether volume and Bitcoin volume is about 91%. This suggests the observed volatility in Bitcoin has real implications for stablecoins. During period of significant volatility in Bitcoin, redemption risks in stablecoins are likely to increase, potentially leading to rollover risk in the cryptocurrency market[7].

[INSERT FIGUREs 3 & 4 ABOUT HERE]

2.2 Bitcoin vs Gold: A Store of Value?

Can Bitcoin replace gold and other precious metals as a store of value and a hedge against inflation? First, for an asset to be considered a store of value it must meet several requirements: [1] Maintain purchasing power over a long duration of time [2] Asset must be easy to transport and durable [3] Asset should have some element of inherent value, either due to historical adoption, government backing or because of economic and industrial use.

Gold meets all of these three characteristics. Gold is limited in supply and as a result

[6]Financial intermediaries can also issue stablecoins. J.P. Morgan uses "JPM Coin" for intra-day repurchase agreements and for liquidity management.But there is still ongoing debate as to whether these types of coins are actually stable coins or digitized alternative forms of payment system (J.P. Morgan, 2020).

[7]See: Liao & CarMichael, 2022, Gordon & Zhang, 2020, for some discussion on stablecoins.

tends to maintain its purchasing power over time, making it a reliable hedge against inflation (Capie, Mills and Wood, 2005). Gold is valued for its aesthetic qualities and does not degrade over time. There has also been a long history of gold being accepted globally in one form or another as a store of value since the end of the 5^{th} century (Graeber, 2012, Taleb, 2021) and as a result gold provide some protection against within country or regional political uncertainties. Gold-backed exchange traded funds make it easy to transport, trade and to own gold as a store of wealth and investors do not necessarily need to hold the actual physical gold. Bitcoin is limited in supply since there are only 21 million hard-coded coins and the supply growth is expected to decrease over time due to the deflationary nature of the Bitcoin protocol (Nakamoto 2008, Lipton 2021). This suggest that the value of Bitcoin cannot be devalued by any central authority such as a Central Bank. However, Bitcoin has yet to be globally accepted as a store of wealth, partially because of its high volatility and because it has only existed for a decade or so. The volatility of Bitcoin significantly weakens its ability to be an effective store of value and a diversifier in an individual's portfolio.

Additionally, during the early 19^{th} century, gold historically served as an automatic stabilizing mechanism. Most major currencies were backed by or linked to gold, and as a result gold has historically served as an important asset during market downturns. In particular, investors tend to hold gold when a currency is depreciating in value and reduce their gold holdings when a currency appreciates. In this regard gold has served as an effective exchange rate hedge; that is both against decline in domestic currency's purchasing power and against domestic currency's purchasing power relative to a basket of foreign currencies (Capie et al. 2005). Unlike fiat currency or gold, the demand for Bitcoin is unpredictable, difficult to stabilize as price appreciation encourages hoarding which could lead to deflation if Bitcoin is the base currency in an economy (Dowd, 2013, Selgin, 2015). Thus, it is not

clear yet what role Bitcoin would play during periods of significant currency fluctuations and whether Bitcoins can serve as an effective exchange rate hedge. Additionally, Figure [5] shows that relative to gold, Bitcoin performed poorly as an inflation hedged during a market downturn in March 2020.

[INSERT FIGURE 5 ABOUT HERE]

Unlike gold, Bitcoin is not a homogeneous asset as there exists a continuous stream of competing cryptocurrencies assets, these also makes Bitcoin less suitable as an inflation or currency hedge for investors. Bitcoin also has no obvious industrial usage, if anything, the cost of Bitcoin mining and its energy consumption are significantly higher than the cost of minting fiat currency (Antonopoulos & Wood, 2018). Figure [4] shows that mining difficulty has been steadily increasing while block size, time between blocks, and number of transactions have been declining. In 2019, the average transaction in Bitcoin consumed about 0.51 megawatts-hours and Bitcoin protocol energy consumption was about 0.3% of global energy consumption (Lipton, 2021). Note that the cost of gold mining, processing, production and energy consumption is generally already priced in due to its long history of usage. This suggest that in order for Bitcoin to replace gold in the near future, its energy consumption cost has to significantly decline, otherwise, at this stage Bitcoin is not an effective alternative to gold and its diversification benefit during a market downturn remains questionable.

[INSERT FIGURE 6 ABOUT HERE]

2.3 Bitcoin: Investment and Diversification Role

Is Bitcoin an investment? If so, where does if fit in an individual's portfolio? Investors have to be able to value an asset in order to determine its relative impact on their portfolio. An

asset is likely to have a diversification role if it is positively correlated with another asset in the portfolio and it has a hedging role if it is negatively correlated with an asset in the portfolio (Baur & Lucey, 2010, Chan et al., 2019). Bitcoin has no fundamentals and therefore it is difficult to value it[8]. Given that Bitcoin has no intrinsic value or industrial usage, its price can range from zero to infinity. The price can be zero because Bitcoin neither pay out dividends nor has future earnings; the present value of Bitcoin price is therefore zero (Taleb, 2021). The price of Bitcoin can rise to infinity due to irrational exuberance. In particular, Bitcoin prices are mostly driven by market sentiments and price appreciation (Weber, 2016). The expectation of a continuous increase in prices divorced of any fundamental value can lead to an irrational bubble (Dale et al., 2005, Shiller, 2005). The fluctuations in the prices of Bitcoin, as show in Figure 1 and Figure 2 above, provide for some opportunities for speculative trading (Dywer, 2014, Cheah & Fry, 2015).

So why is there institutional interest in Bitcoin? First, the price fluctuations in Bitcoin and in other cryptocurrencies provide some alpha and some profit-making opportunities. Given that other cryptocurrencies are currently priced in Bitcoin, it provides for some arbitrage opportunities as well. Arbitrage opportunities exist because of price differentials between crypto-linked assets in traditional finance and on-chain products; making Bitcoin potentially valuable in portfolio management (Karniol-Tambour et al., 2022, Tully & Lucey 2017, Dyhrberg, 2016). Second, institutional investors might treat Bitcoin as a long-duration asset, anticipate that due to its limited supply and potential price appreciation, there would be future opportunities to offload at a higher price. Third, institutional investors are investing indirectly in Bitcoin and in the cryptocurrency space via venture capitals that uses Blockchain technology as it aligns well with their investment

[8]Theoretical, the value of Bitcoin (as an asset) is approximately the discounted sum of its cash flows, service flow and some speculative or heterogeneous beliefs regarding the asset.

mandates (Karniol-Tambour et al., 2022). In particular, high-frequency trading (HFT) funds and long-short equity funds that use cash-and-carry strategy have netted an average return of at least 10% by buying Bitcoin and selling CME futures. Institutional investors are therefore able to reduce risk exposure from investing in cryptocurrency space by either investing in the early stages of these exchanges or by using sophisticated trading strategies[9]

On advantage of investing in Bitcoin is that it provides some protection against inflation as the central bank cannot devalue it. But this protection comes at the expense of increasing volatility in the portfolio. The speculative fervor in the cryptocurrencies space suggest that individuals should be concerned about the level of exposure in their portfolio. Profit making opportunities for retail traders are likely to decline as institutional investors and hedge funds using sophisticated trading strategies take advantage of the mispricing and other market inefficiencies in the cryptocurrency space. The fact that the hedging and diversification abilities of Bitcoin depends on the data frequency[10], in the long run, can only make Bitcoin less desirable relative to alternative assets. Figure [7A, B] shows that Bitcoin returns are more volatile than S&P500 returns over the same duration. Trades per minutes have also been on the rise across all exchanges (Figure 8). Liquidity, as proxy by bid-ask spread in Figure 9, has also been steadily increasing, reflecting growing interest in Bitcoin.

Additionally, the price of Bitcoin remains high, liquidity is low relative to major indices and there is some evidence of price manipulation in the cryptocurrency space (Griffin & Shams, 2020). The factors could potentially limit and discourage ownership of Bitcoin and related cryptocurrencies. However, the rise of exchange-traded funds (ETFs) in this space provides some opportunities for small and regular investors to have an indirect exposure to

[9]Some of these strategies include: tail-risk hedging, factor-based investing, stock-picking and asymmetric bets using options that leverage the inefficiencies in the crypto-market space.

[10]See: Bouri et al., 2017, Chan et al., 2019

the cryptocurrency market.

[INSERT FIGUREs 7, 8, 9 ABOUT HERE]

2.3.1 Bitcoin: Political Uncertainty and Dictatorial Regimes

Is Bitcoin a safe haven? Bitcoin can provide a channel for the transfer of large funds across international borders independent of any third-party or entity. This provides some protection against dictatorial regimes or during periods of political uncertainty. Case in point, Figure 10 shows that Bitcoin price and returns increased significantly when compared to gold during the immediate onset of the ongoing Russian-Ukrainian conflict. This illustrates that Bitcoin can serve as a safe asset ("flight-to-quality") during periods of significant political uncertainty.

[INSERT FIGURE 10 ABOUT HERE]

2.4 Is Bitcoin a Collectible Asset?

Collectibles are a form of alternative investments. These generally include: fine arts, baseball cards, rare coins, comic books and rare books. In addition to the pecuniary benefits, alternative investments generally provide some subjective utility to the owners. Bitcoin can be a collectibe in an individual's portfolio. Bitcoin can be considered to be a "rare" collectible since there are only 21 million hard-coded Bitcoin and 90% have already been mined; thus, it has a residual value that makes it valuable to hold into the future. The holders of Bitcoin might also infer some value from both the embedded technology and in being a part of a new and potentially useful innovative idea. Bitcoin protocol has become a useful baseline for the new wave of cryptocurrencies, building smart-contract-based tokens and other distributed ledger technology (DLT). Smart-contracts are simply a set of rules stored in the Blockchain that are automatically

executed once the set conditions are met thereby facilitating exchanges and transactions independent of a third-party. The utility that comes from being at the forefront of this new movement and in leveraging Big data in the cryptocurrency space makes Bitcoin a valuable collectible asset. Collectibles are transferable inter-generational assets and given that the block creation fee is projected to go down to zero in the year 2140, this could potentially explain why about 70% of Bitcoins are contained in less active and dormant accounts (Cheat & Fry, 2015). Additionally, the rise of non-fungible tokens (NFTs) which are digital collectibles that enable users to authenticate ownership as transactions which are recorded on a Blockchain, demonstrate that Bitcoin and other cryptocurrencies have some features in common with other collectible assets. Unlike Bitcoin and other cryptocurrencies, NFTs have an intrinsic value since they cannot be exchanged like-for-like. The intrinsic value of NFTS increase their applicability and marketability to a wider audience. NFTs employ blockchain technology in two major ways. First, blockchain technology is used to create play-to-earn games in which users are incentive to play the game via a reward, usually in form of a token. Second, blockchain technology is used to create a metaverse, which is a form of virtual world in which various tokens can be use to trade different types of assets including virtual properties and artworks (Aharon & Demir, 2021).

3 Discussion and Conclusion

3.1 What is Bitcoin's Real Contribution?

Cryptocurrencies, Big Data and Blockchain Technology

What is the long-term value and contribution of Bitcoin to society? Bitcoin protocol and Blockchain technology has been utilized to create a wide arrays of new cryptocurrency

assets and new digital products. For example, Ethereum utilize Bitcoin's protocol to build a decentralized transaction-based state machine that uses a cryptographic hash to collate transactions into a blockchain (Wood, 2015). Thus, the built-in Turing-programming language in the Ethereum blockchain can quickly create smart contracts from an arbitrary set of codes (Buterin, 2013, Lipton, 2021) and the PoW simply then ensures absolute confidence in the future viability of the protocol since each mined block has a reward attached to it. Additionally, Ethereum provides a potential solution to the ASICs problem in Bitcoin protocol via the Ethash algortithm (Buterin, 2013, Dryja, 2014, Jentzsch, 2015). However, Ethereum has scalability problems since supply is limited to only 18 million ETH per year. Ethereum underlying protocol is quite costly to use as smart contracts tend to require a large collateral in their operations (Lipton, 2021, Antonopoulos & Wood, 2018). Bitcoin Blockchain technology is also currently being utilized to build decentralized finance (DeFi). DeFI are based on a Consensus as a Service (CaaS) and can be used to create smart-contracts based (cryptocurrency) exchanges independent of a third-party (Lipton, 2021).

Furthermore, Blockchain technology is potentially a useful tool in solving Big data challenges. For example, healthcare providers are faced with challenges ranging from access to patients' health data, legal issues, secure storage and ownership of the data. Blockchain technology can provide a secured structure in which healthcare providers store patient's metadata in a blockchain and then the patient is provided with a unique key that they can use to access their health data anywhere (Gupta et al., 2016, Rapke, 2016). Applications such as "Storj" that use blockchain to ensure secured peer-to-peer authentication of storage contracts are potential solutions to Big Data challenges in the healthcare sector (Zhang et al., 2019). Storj uses smart contracts to manage, record and keep a timestamp of data

sharing. Blockchain technology can also be used in protecting intellectual property rights and in authenticating ownership of digital art. An interesting implementation and application of Blockchain technology in this area is the "Secure Public Online Ownership Ledger" (SPOOL), which can be used for documenting transactions, transferring ownership of each edition of the artwork and recording it in a blockchain, which allows for tracking and authentication of ownership (Dimitri & McConaghy, 2016, McConaghy & Holtzman, 2015, Karafiloski, 2017). Some applications of Blockchain technology in marketing and supply chain management include "Omnilytics and "Provenance" (Depa et al., 2021). Blockchain in these applications is used to collate sales, marketing, industry trends and product information data during each point in the supply chain (Kim & Laskowski, 2018). For example, Walmart and IBM have utilize blockchain (Hyperledger Fabric) to create a food traceability systems and early tests of the system have shown that blockchain technology can significantly reduce the time it take to trace the provenance of a produce in the supply chain from days to seconds (Hyperledger, 2020). Blockchain based applications such as "Rubix", provide decentralized trading platform in which users can buy and sell cryptocurrencies and digital assets independent of a financial intermediary.

Blockchain technology is also useful in addressing some of the Big Data challenges in the financial services sector. Because data management is critical for financial institutions, most transactions generally incur some fees. These fees and charges erode returns to banks' clients and shareholders. Blockchain technology can ensure that banks monitor, detect and prevent fraudulent transactions at a minimum cost. Signature Bank has launched a blockchain-based payment platform called "Signet". The platform provides a channel via which Signature bank's commercial clients can transacts with other commercial clients at zero cost, effectively eliminating the need for a third-party. Blockchain technology has also

been used to address some of the challenges in the securities lending markets. For example, Deutsche Boerse launched a distributed ledger technology in swap trading, which has reduced the cost of trading in these types of financial instruments (J.P. Morgan, 2020). These applications demonstrate that Blockchain technology goes beyond simply the creation and minting of new digital coins and that it can potentially provide solutions to real challenges for both individuals and businesses. These applications also demonstrate that the emerging technologies underpinned by blockchain or smart contracts can be engines for economic growth.

3.2 Government Regulations

Understanding the role of government regulations on cryptocurrency space is important as regulations affect both Bitcoin's long-term adoption as a currency and tax treatment as an asset. Aristotle argued that that money derives its value not from nature but from the law and can therefore be altered or abolished at will (Crisp, 2014). This clearly demonstrates that the potential global adoption of Bitcoin by both retail and institutional investors largely depends on governmental regulations.

Why should the government be interested in the cryptocurrency space? And why should investors care about regulations? There are two important reasons: [1] Bitcoin is a potential channel for money laundering which could potentially impact the value of the reserve currency (U.S dollar) and other major currencies. If the U.S government decides to ban Bitcoin and related digital currencies, then this would automatically drive their values to zero, making them less desirable for investors. And if the government decides to introduce its own digital currency alongside Bitcoin, then this can only increase Bitcoin's price volatility and weakens its diversification role. Indeed, the ban on cryptocurrency

mining and initial coin offerings by the Chinese government in 2017 led to a precipitous drop of about 7.8% in Bitcoin prices. China, driven by concerns regarding the potential impact of a decentralized digital currency on monetary policy and subsequent impact on fiat currency (Renminbi), is in the process of introducing a Central Bank Digital Currency (CBDC). Cryptocurrencies users are more likely to use CBDC than their alternative decentralized digital currencies[11]. [2] Bitcoin and other cryptocurrencies are potential sources of revenue since they can be treated as taxable investment vehicles. Some countries such as Canada (CRA) consider cryptocurrencies as commodities and are taxed as either business income or as capital gains (50%). And if cryptocurrencies are used for exchange of goods and services then they are treated as barter transactions. Hungary tax any cryptocurrency income at 15% once it has been converted to fiat currency regardless of the source(s). The U.S government (IRS), as of 2022 tax year, treat Bitcoin and other cryptocurrencies as "property" and therefore taxable assets. The long-term impact of IRS policy is yet to be clear but this could only facilitate a wider adoption and lead to further increase in the price volatility of Bitcoin. Taxes will further erode some of the gains, making Bitcoin less attractive to investors relative to alternative assets that might have more favorable tax treatment.

4 Conclusion

This chapter examines whether Bitcoin is the payment system of the future? The findings are that Bitcoin is neither gold nor currency, but that it is a tradable asset and an alternative form of investments. Bitcoin also exhibit some features as an investment asset

[11]Note that following China's ban, some miners simply moved their rigs to energy-rich countries such as Kazakhstan (Oxford Analytica, 2021).

that are similar to collectibles. The true value of Bitcoin lies not in its speculative nature (price appreciation) but in the embedded technology (Blockchain, Defi and Distributed Ledger Technologies) which has the long-term potential of revolutionizing traditional finance. Blockchain technology can provide solution to Big data challenges; that is in collecting, organizing, controlling and storing a large amount of data. Bitcoin's long-term survivability and viability as an asset will largely depend on its diversification role, tax treatment and government regulations.

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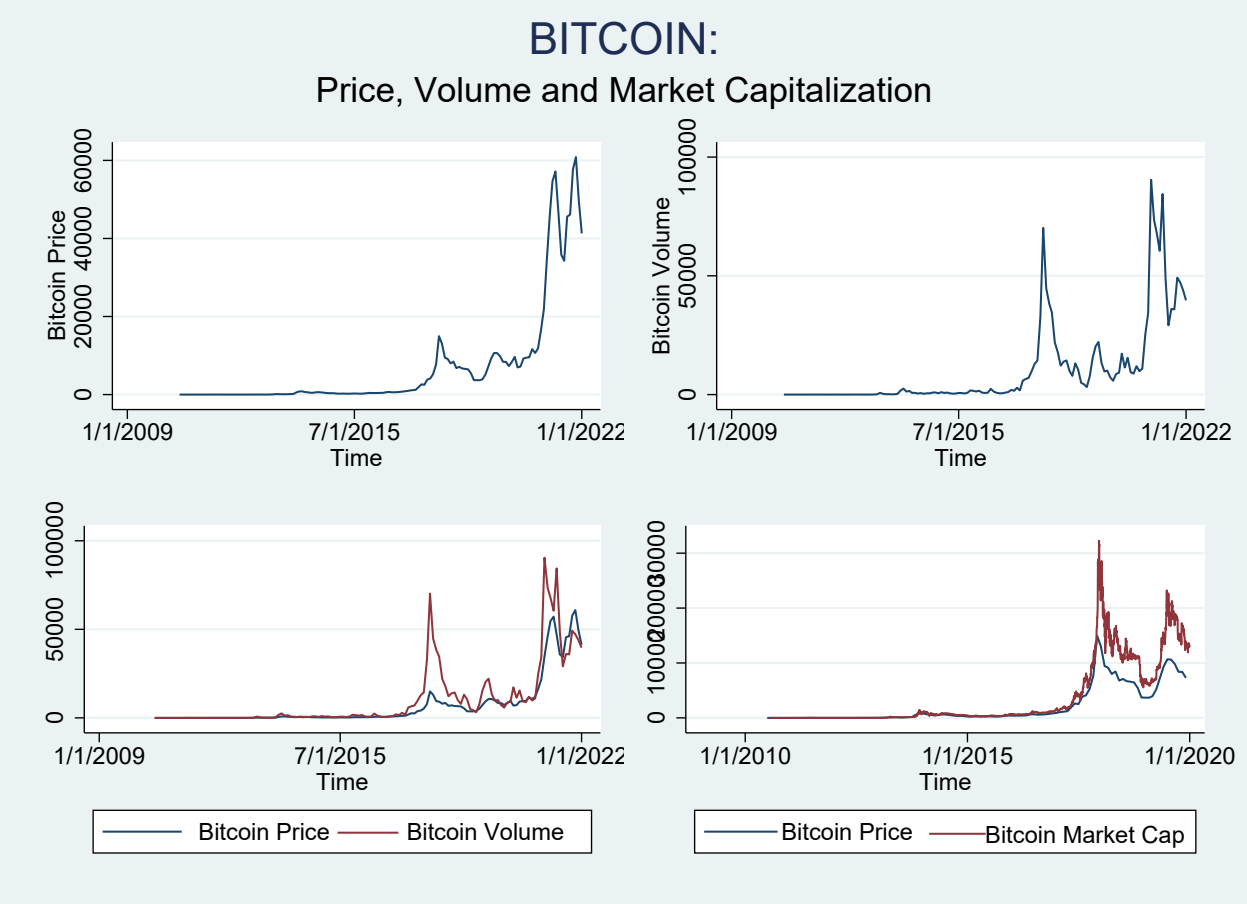

Figure 1: ***Bitcoin:***

This figures present timeseries evolution of Bitcoin's prices, volume and market capitalization. The figures reflect increase demand and growing interest in Bitcoin as an asset.

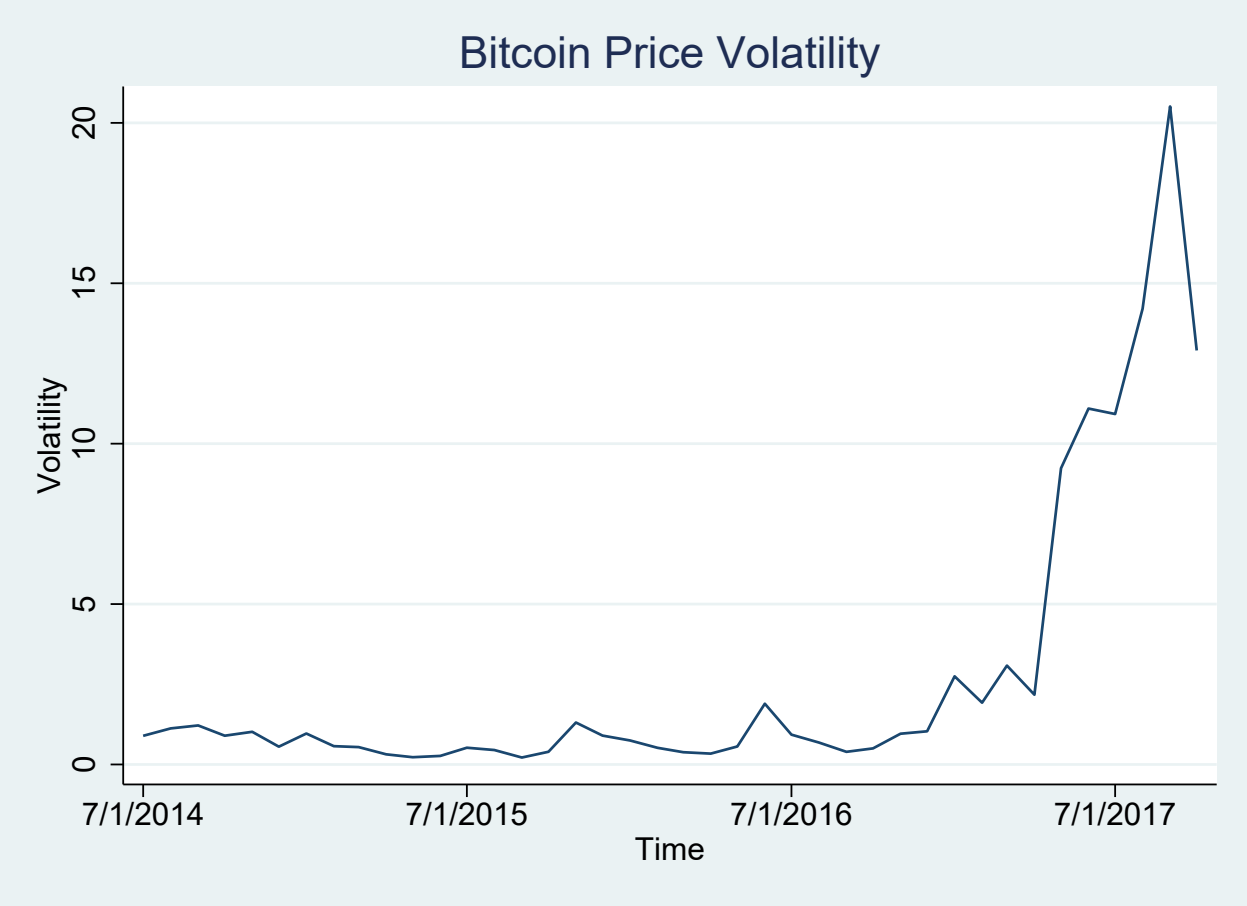

Figure 2: ***Bitcoin Price Volatility:***

This figure shows that Bitcoin price volatility has been steadily increasing over time.

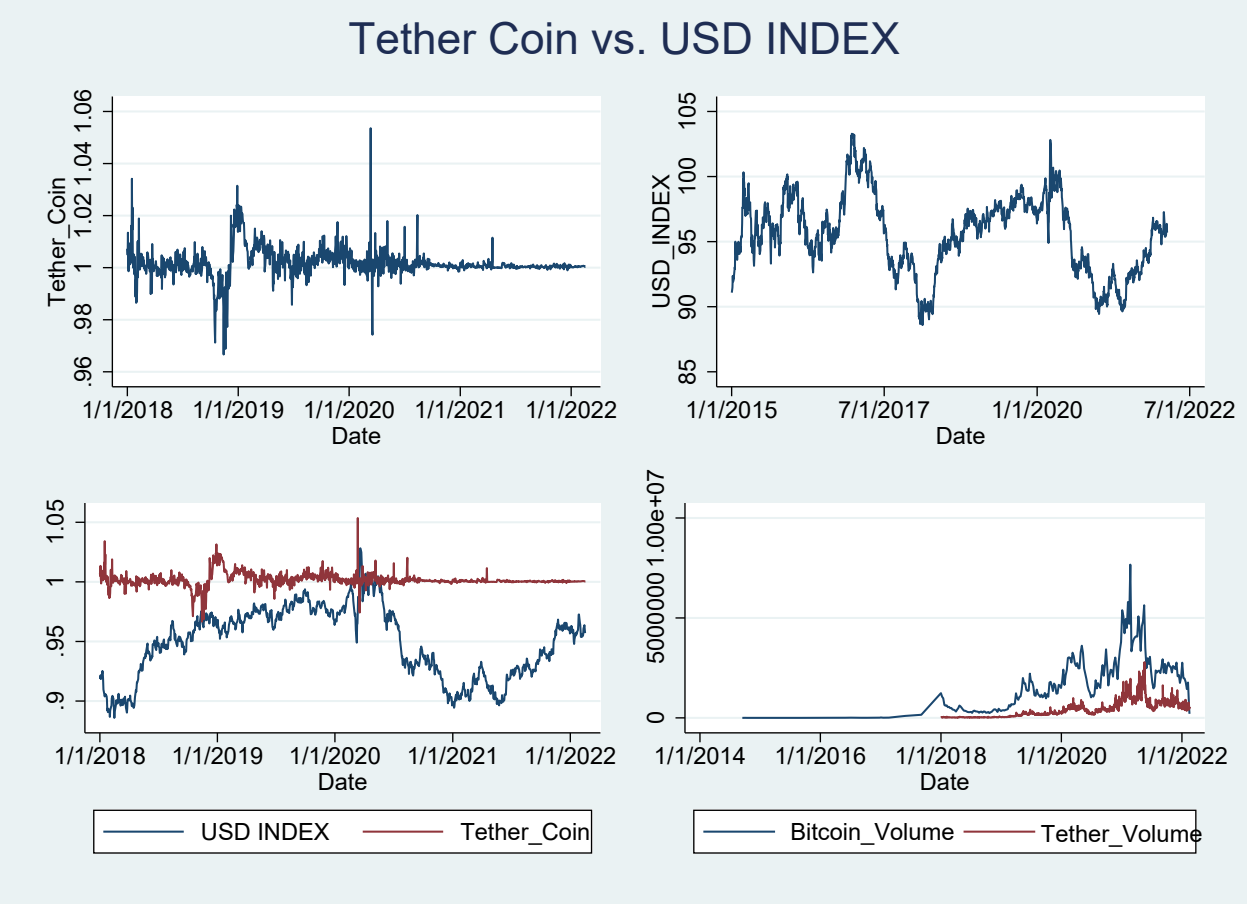

Figure 3: ***Stablecoins: Tether vs USD Index***

These figures illustrate the time series evolution of Tether relative to USD Index. And Tether Volume relative to Bitcoin Volume.

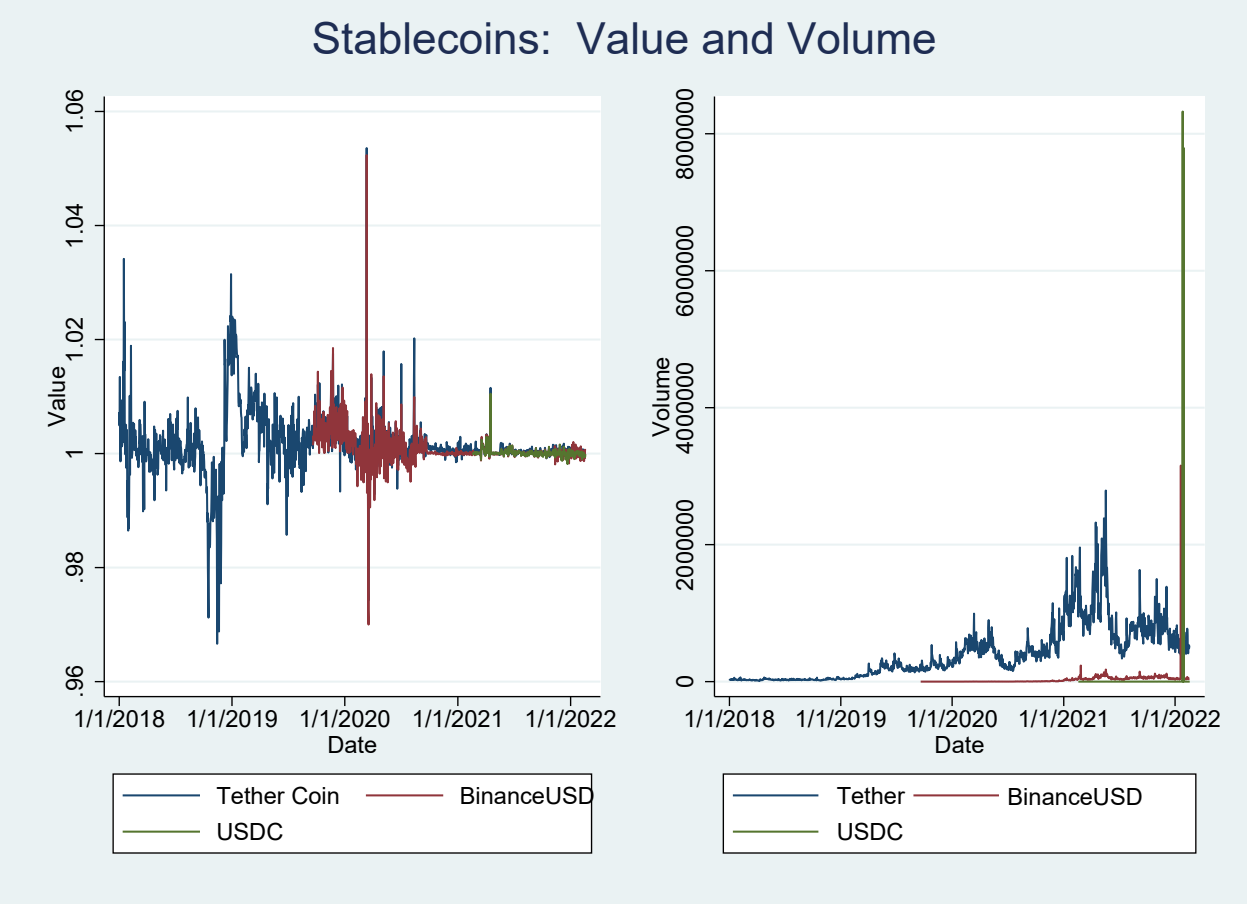

Figure 4: ***Stablecoins***

These figures illustrate the time series evolution of Tether relative to USD Index. And Tether Volume relative to Bitcoin Volume.

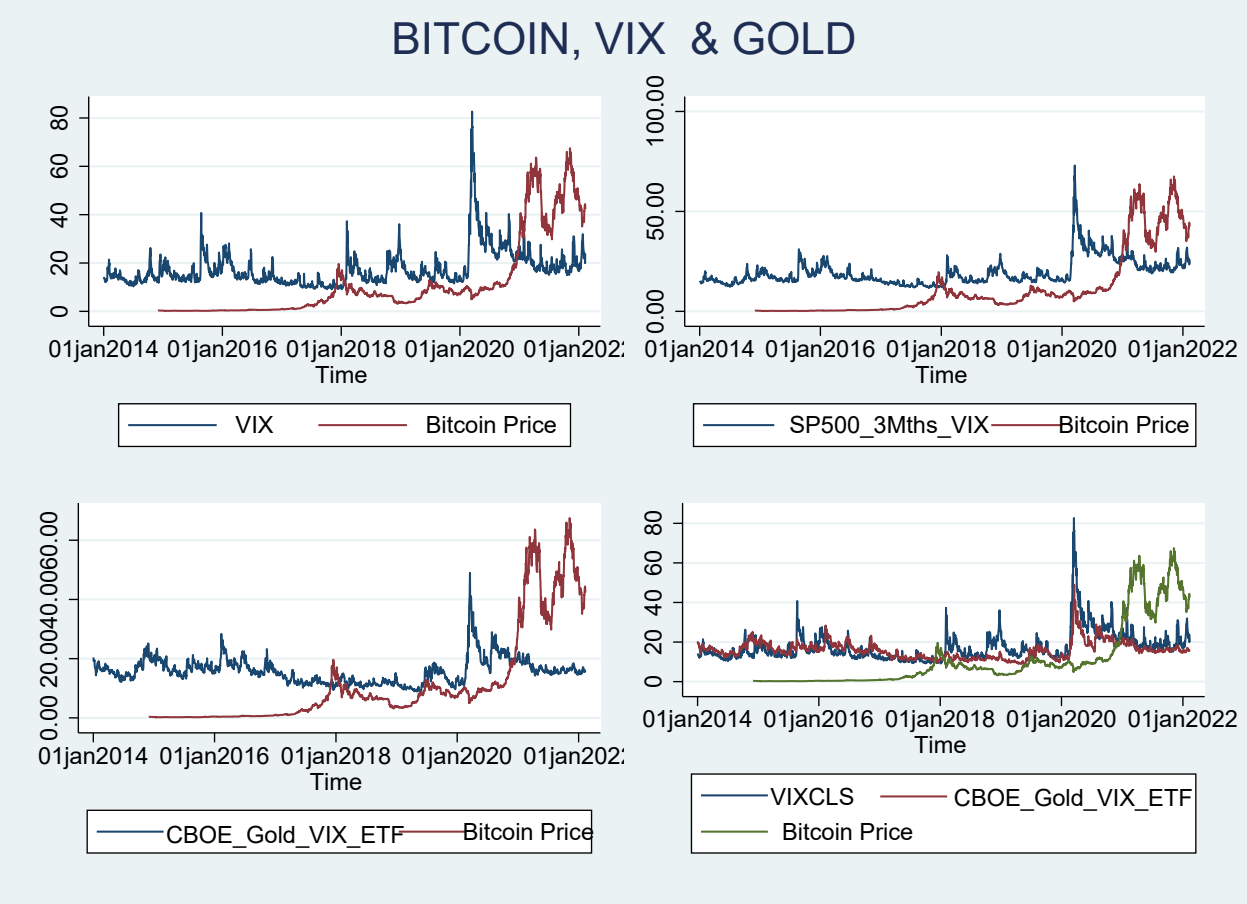

Figure 5: ***Bitcoin vs. Gold:***

These figures present a time series analysis of VIX, S&P500, CBOE gold VIX ETF and Bitcoin prices. Observe that in March 2020, when there was a market downturn, Bitcoin prices diverged from VIX and Gold, indicating that Bitcoin does not perform as well as gold as an inflation-hedge.

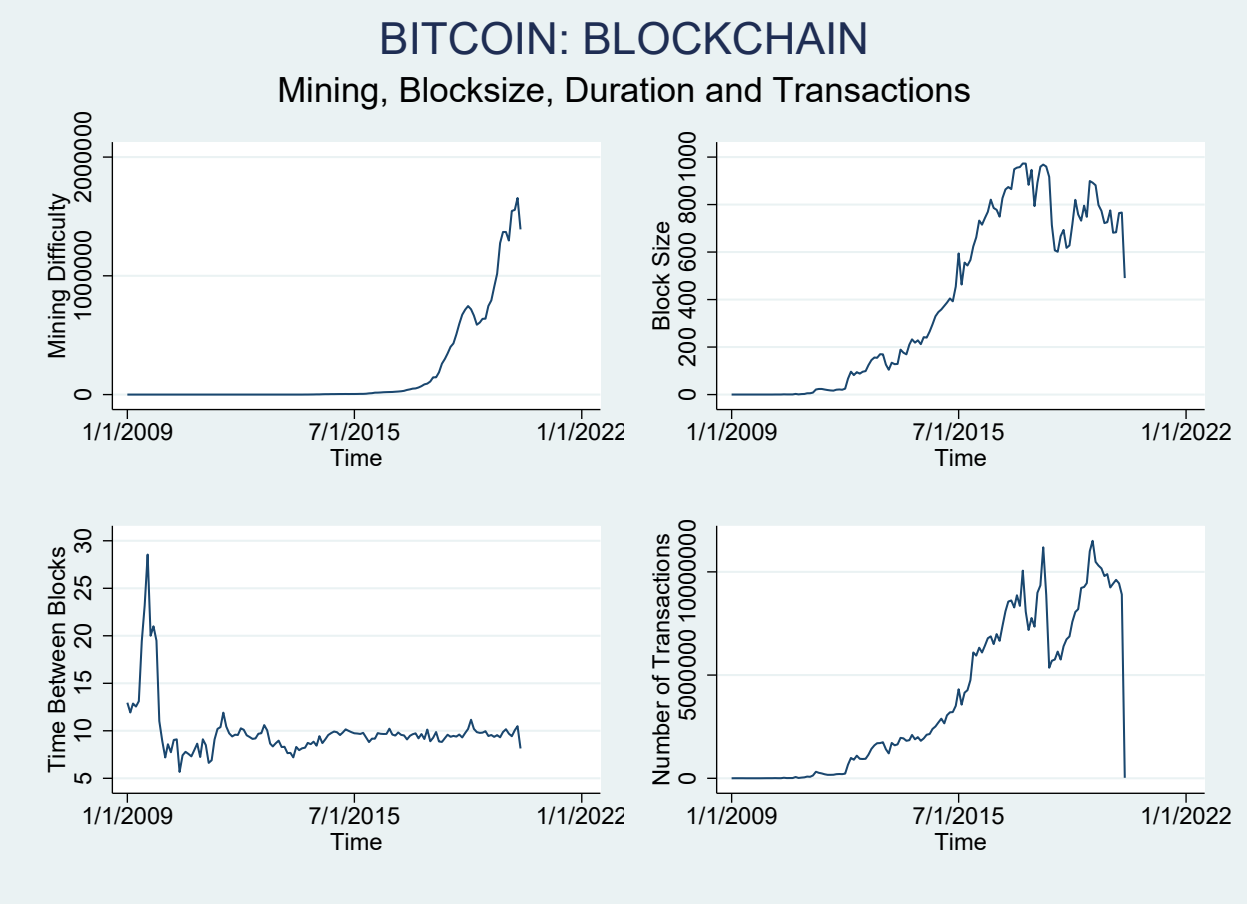

Figure 6: ***Bitcoin Blockchain:***

These figures shows that Bitcoin mining difficulty has been on the rise while the average block size, time between blocks and number of transactions has been declining.

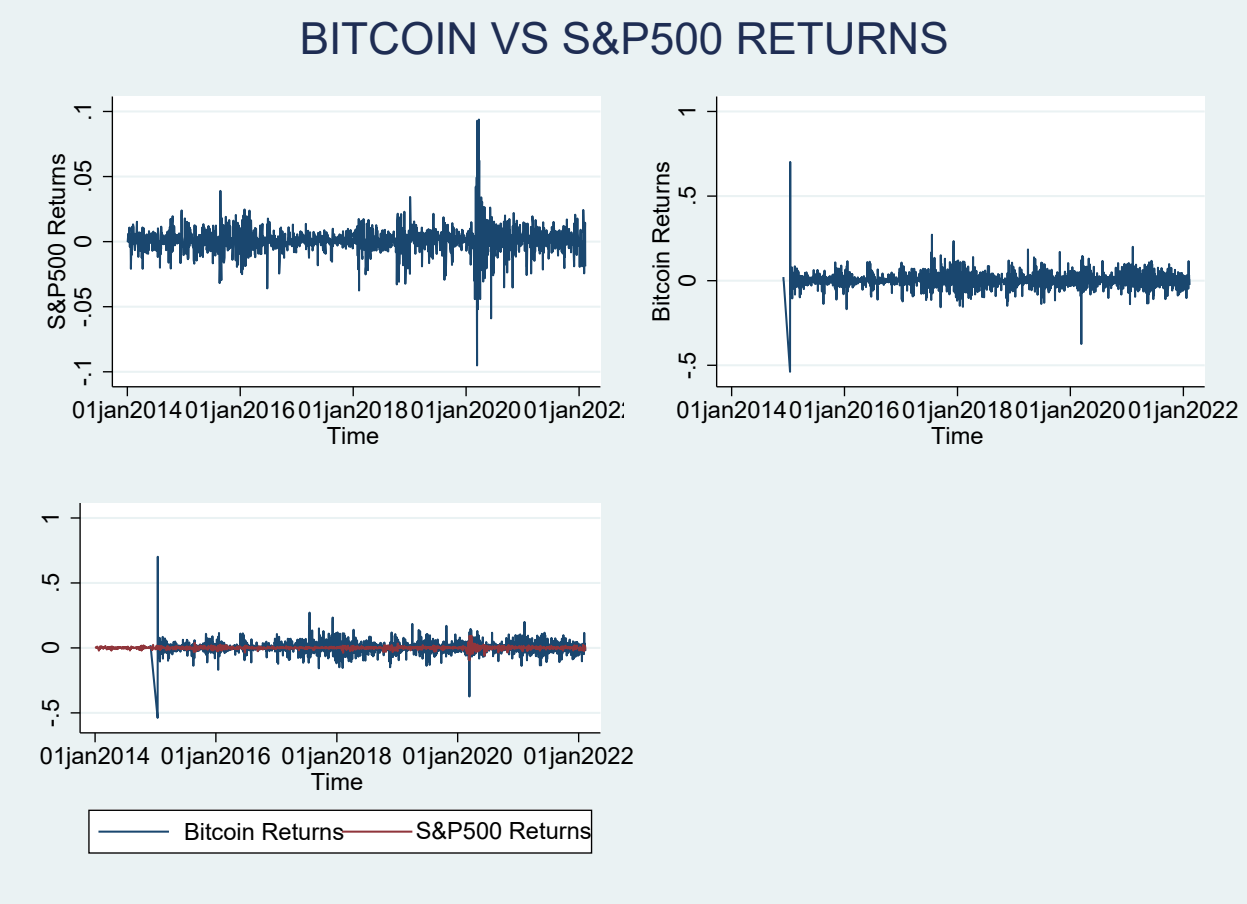

Figure 7: ***Figure 7A: Bitcoin vs. S&P500 Returns:***

These figures compare the average returns of S&P500 to Bitcoin. Bitcoin's returns exhibit higher variability when compared to S&P500's returns.

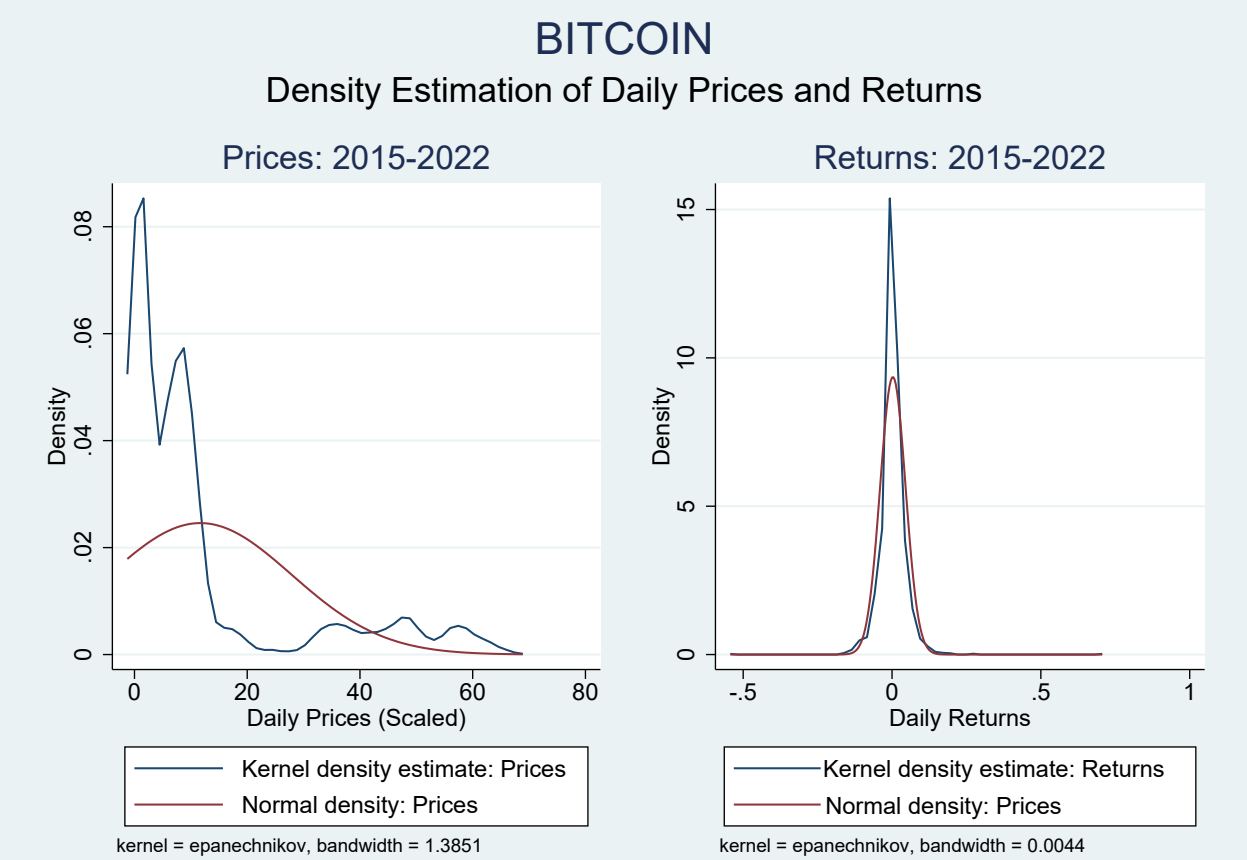

Figure 7B: Bitcoin_Density Estimates:

These figures compare the average returns of S&P500 to Bitcoin. Bitcoin's returns exhibit higher variability when compared to S&P500's returns.

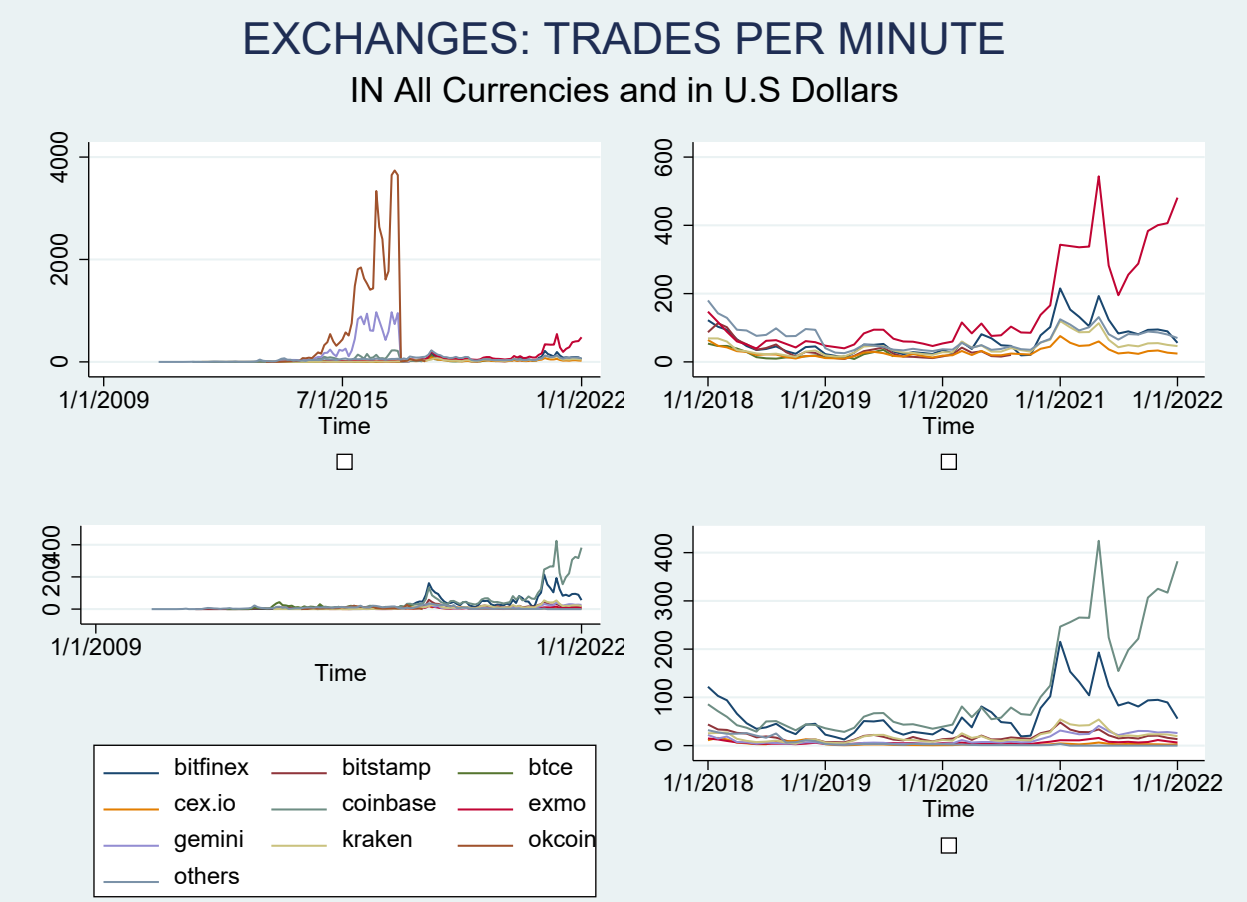

Figure 8: ***Exchanges: Trade per Minute:***

These figures show that average trades per minute have been increasing across all exchanges, reflecting growing interest in Bitcoin.

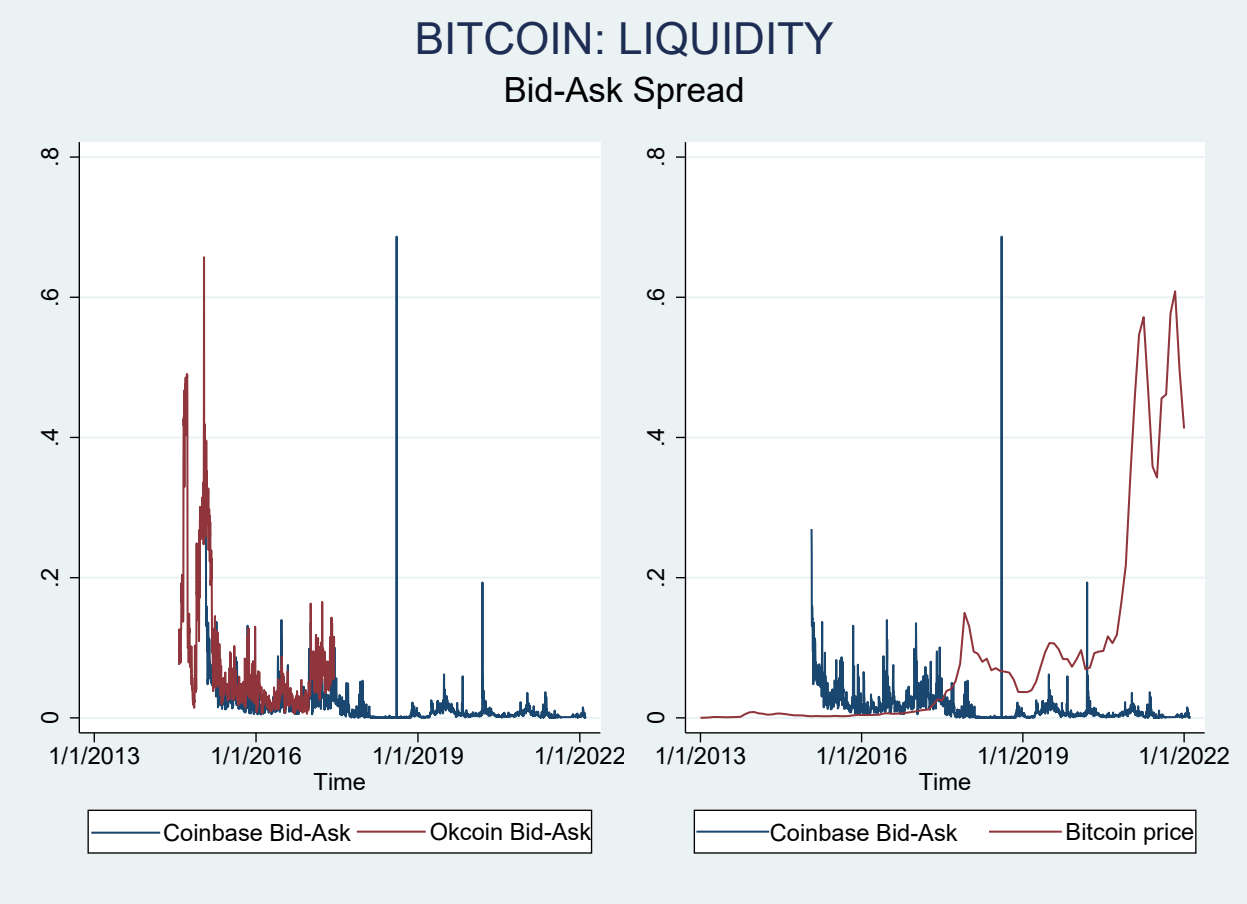

Figure 9: ***Bitcoin: Liquidity***

These figures shows that the average Bid-Ask spread has been on the decline, reflecting growing demand and interest in Bitcoin.

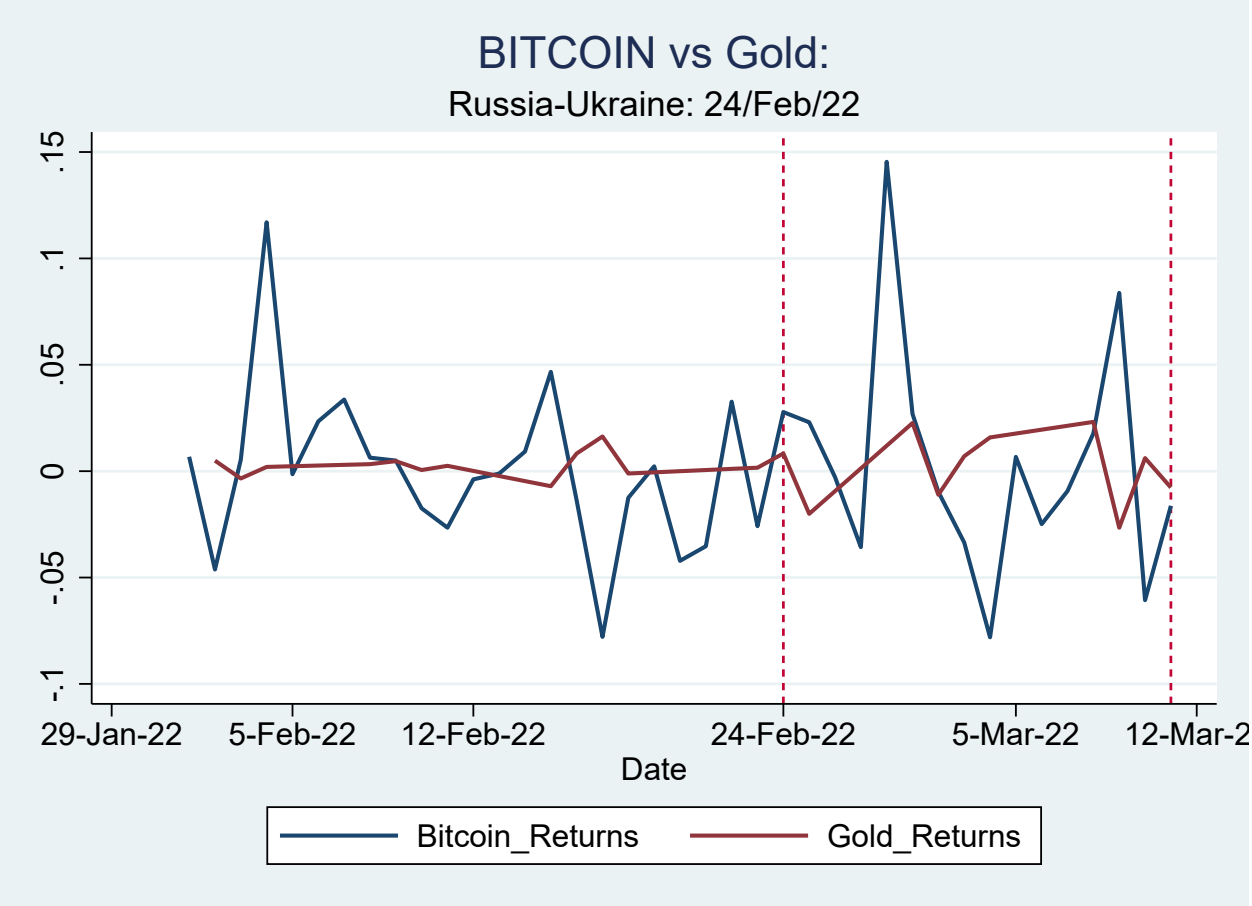

Figure 10: ***Russian-Ukrainian Conflict:***

This figure compares the average returns of Gold and Bitcoin around the onset of the Russian-Ukrainian conflict. Bitcoin exhibits relatively higher average returns but also higher volatility relative to gold.