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RESEARCH ARTICLE

Cryptocurrencies and the State: Can They Become Disruptive Enough to Overthrow the Status Quo?

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Abstract
Cryptocurrencies have grown to be very significant during the past two decades. Starting off at the way cryptocurrencies, specifically Bitcoin, operate, we move forward towards the discussion on their nature as currency and their disruptiveness. We navigate through the political character of Bitcoin over the years, the potential of Bitcoin and other cryptocurrencies to threaten a state's sovereignty and an overview of state responses to cryptocurrency. Finally, there is a number of speculations and suggestions on how Bitcoin could grow and gain a less controversial position in the global economy.

Keywords: Cryptocurrency, State, Digital Currency, Regulation, Money, Blockchain, Disruptive Technology

Introduction

It is no secret that this past decade was marked by the birth and rise of cryptocurrency. The most well-known cryptocurrencies have reached the headlines of popular media and have even become household names. What started as an initiative of programmers wishing to avoid governments and institutions, is now a global market worth as much as 2 trillion US dollars in 2021 (Ossinger, 2021). Inevitably, this phenomenon has become a topic of discussion, to say the least, for governments all over the world. Various governments have chosen to implement strict measures to regulate cryptocurrencies within their borders while others have chosen to embrace them.

The aim of this paper was to explore through existing literature on the subject whether cryptocurrency has the potential to become a power equal to big conventional currencies and whether it can threaten the power and the sovereignty of modern states.

During the research for this paper, it was evident that a significant number of sources was focusing on the technical, legal, and financial aspects of cryptocurrency, while less emphasis was given to the

political and social impacts of this technology. It should also be noted that this paper describes a rapidly transforming field and, thus, regardless of the author's best efforts, it might soon include outdated information. Finally, due to the vast number of cryptocurrencies in existence at the time of writing and due to the fact that not all are sufficiently documented or impactful, Bitcoin[1] will be the center of this discussion, while references will be made to other popular cryptocurrencies. This is also reminded in other sections of this paper for clarity.

The rest of this paper will be structured as follows: Section 1 includes a brief summary of how cryptocurrencies function. Section 2 focuses on exploring whether cryptocurrency can qualify as money and whether it is a viable form of currency. Section 3 navigates through the relationship between cryptocurrencies and governments, as well as with financial institutions. Section 4 explores speculations made about the future of cryptocurrencies and their potential for the future.

1. The Modus Operandi of Cryptocurrencies

In order to better introduce cryptocurrencies, the first step in this essay will be to explain their nature and mode of operation briefly. Due to the vast number of cryptocurrencies, the following paragraphs will emphasize on the operation of Bitcoin. It should be noted, however, that there is a wide variety of protocols used in blockchain coding, and that not all cryptocurrencies function in a completely similar manner.

To commence, cryptocurrencies are an application of the blockchain technology, which is a subset of DLTs (Distributed Ledger Technologies). Effectively, this means that a blockchain is a database which is distributed to several computers in a network and structured as "blocks" of information, each timestamped and connected with the previously filled "block" of information, forming a "chain" of data. Cryptocurrencies are tokens which are hosted on cryptographically secured blockchains.

All bitcoin transactions are recorded in a blockchain. The novelty of Bitcoin which allowed it to become so important and so popular, even though other digital currencies and cryptocurrencies already existed, is the fact that the blockchain technology prevents double spending of the tokens in transactions by using peer-to-peer network decentralization (Ametrano, 2016).

[1] Bitcoin consists of the Bitcoin protocol (by convention written with uppercase B) and the bitcoin (BTC) currency (by convention written with lowercase b).

A digital bitcoin wallet has a public address, also known as a public key. The number of bitcoins that are associated with any address is also public and it is certified by the blockchain. There is a complementary private key which produces a digital signature in the event of a transaction. The details of the transaction also include the receiver's public key and the currency amount. Every transaction is distributed to the Bitcoin network, where it is validated by one of the nodes. This secures the network and diminishes double spending, with every new transaction added to a block of multiple transactions and finally added to the blockchain by nodes of the network performing a mathematical proof-of-work verification protocol.

The nodes which participate in this process are called miners and are rewarded for this participation per block, by the issuance of new bitcoins. Economic incentivizing is important in securitizing the blockchain. Nevertheless, there is a predetermined maximum number of BTC, which is 21 million. The rate was 50BTC/block in 2009, and it is due to halve after every 210,000 blocks, which means that it is asymptotically approaching zero until it reaches the minimum subunit of one satoshi[2] (Vora, 2015).

2. Cryptocurrency, Money and Disruption

In 1977, Friedrich Hayek performed an interesting analysis on money; specifically, on the government monopoly of the provision on money and his proposal of banks issuing competing private currencies, which he considered to be "a crucial issue which may decide the fate of free civilization" (Hayek, 1977/1990, p. 132). His idea was, in essence, to issue a currency and announce the intention of keeping its pre-defined purchasing power as constant as possible. Additionally, it included a proposal to state the precise commodity equivalent in terms of which he intended to keep the value of the currency constant but also reserved the right to alter the composition of the commodity standard, after announcement, according to the preferences of the public and experience. He expected that regulation of the quantity of the currency issued would keep the value of the currency constant and that it would also efficiently regulate the quantity of media of exchange. This plan could eventually displace the national currencies if they "misbehaved", i.e., if they were to continuously be unreliable, less useful, less "honest". He was a firm believer of the idea that competition in currencies would raise the quality and blamed government monopoly and intervention for having financial crises and "bad" and

[2] 1 satoshi= 10^{-8} BTC

unreliable money, because "good" money would come from the issuing institutions acting for their own interest (Hayek, 1977/1990). And then, cryptocurrencies were created.

Cryptocurrencies seemed to fulfill Hayek's dream of money detached from the governments since their value is not defined by a centralised institution or a government. Created by the pseudonymous entity, Satoshi Nakamoto, it was born by an idea quite similar to Hayek's, only it completely diminishes the factor of issuer institutions. In their own words:

> "The root problem with conventional currency is all the trust that's required to make it work. The central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust. Banks must be trusted to hold our money and transfer it electronically, but they lend it out in waves of credit bubbles with barely a fraction in reserve. We have to trust them with our privacy, trust them not to let identity thieves drain our accounts. Their massive overhead costs make micropayments impossible. […] With e-currency based on cryptographic proof, without the need to trust a third party middleman, money can be secure and transactions effortless" (Nakamoto, 2009).

Now, considering the fact that many economies function under capitalism but with a strong presence of the State, Bitcoin seems to pose a threat to the existing structures (Partanen, 2018).

A significant part of the discussion on cryptocurrencies has been about whether they qualify as money or not. Most agree that bitcoin does qualify as a medium of exchange, but since it is not a popular medium of exchange that the majority accepts as a payment, its status as money is disputed (Davidson & Block, 2015). As quoted by Vora (2015: 817), "Money is what money does", with the functions of money categorized as follows:

I. *Primary:*
    1. *Medium of exchange,*
    2. *Measure of value,*
II. *Secondary:*
    1. *Standard of deferred payment,*
    2. *Store of value,*
    3. *Transfer of value,*
III. *Contingent:*

1. *Basis of credit,*
2. *Mobility and productivity of capital,*
3. *Distribution of economy's output,*
4. *Optimality condition of equalizing marginal utilities and marginal productivities,*

IV. *Motives:*

1. *Transactional,*
2. *Precautionary,*
3. *Speculative.*

[…] Some of the attributes, not necessarily the functions, of money are portability, ease of portability, durability, forgery-proof (inimitability or difficulty to counterfeit), divisibility, liquidity, stability of inflation, stability of credit, stability of asset prices, trust in its governance, confidence in its prevalence, acceptance and value, etc. (Vora, 2015:817).

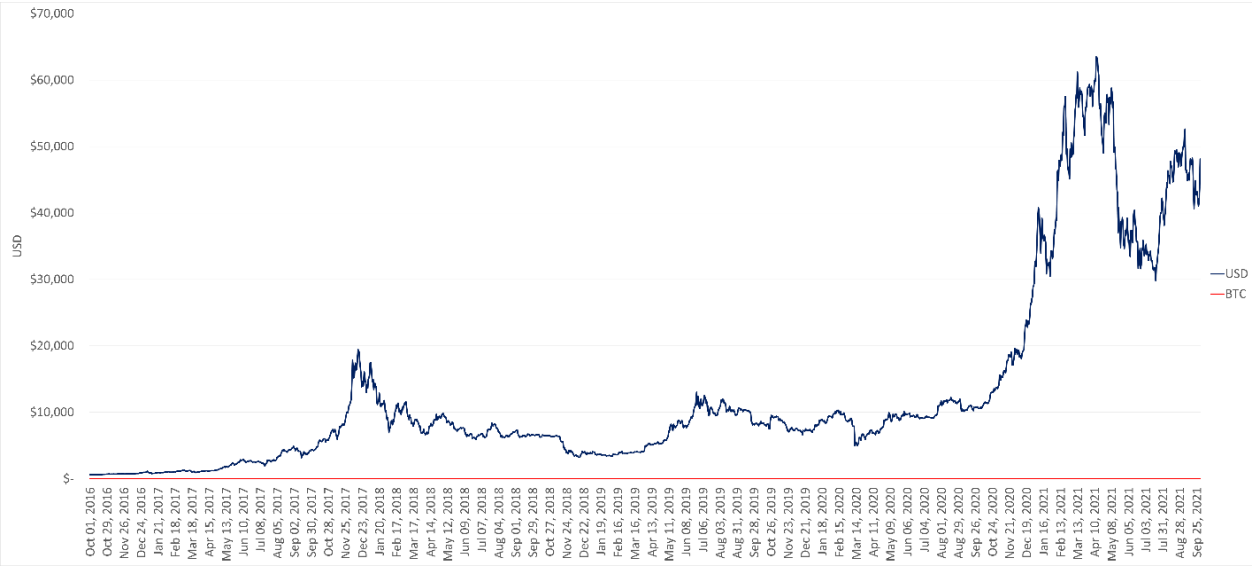
Bitcoin is a digital currency, virtually impossible to be forged and easily accessible, provided that the user has access to a computer, an internet network, and their account[3]. On that occasion, portability of bitcoin is quite similar to that of cash and even better. Bitcoin is also more durable than cash or any physical currency due to the fact that there is no physical form to be worn or corrupted.

There are various opinions on whether cryptocurrency fulfills the essential functions of money efficiently. What is generally agreed upon, is the fact that, even though it is functioning as a medium of exchange, the highly volatile value of bitcoins (see Figure 1) renders it problematic as a potential currency.

Nakamoto's creation was created to act like gold, with its limited supply to act as a measure against inflation issues. Evidently, this measure was not successful since Bitcoin is considered to be deflationary. Bitcoin, unlike gold, is not traded at high volumes and it has low liquidity as an asset and the algorithm controls the rate of the mining of new bitcoins, thus the response abilities of Bitcoin to changes in demand is limited. Price volatility is a direct result of the aforementioned factors (Partanen, 2018).

[3] This raises an issue of whether cryptocurrencies are inherently classist, due to the fact that access to the aforementioned resources and education regarding cryptocurrencies is not universal. However, this is an issue for further research and will not be discussed in this essay.

Figure 1: Closing price of BTC in USD, from October 1st, 2016, to October 1st, 2021.



Source: CoinMarketCap (2021), data edited by the author.

Further contributing to the volatility of the price of bitcoin, it has been argued that most bitcoin transactions are motivated by speculations and that, since there is no price anchor, speculation reinforces demand shocks and magnifies short-term movements into major disturbances (Harwick, 2016). It could be speculated however that as the adoption of Bitcoin grows, the value will grow as well and become more stable (Vora, 2015). Even though we will not delve into that subject, there is a sub-division of cryptocurrencies, widely known as stablecoins, which aim to provide price stability via collateralization with an asset or through their coding. Should a stablecoin gain the popularity of Bitcoin, it will have this significant advantage against it.

There have been concerns about the lack of intrinsic value of bitcoins. Regardless, as Hayek had argued, the money used worldwide is fiat money, money which derives its value from government regulation or law and it is validated by law as legal tender (Ametrano, 2016). The difference of cryptocurrency with physical currency on this topic, apart from the role of the government, is that physical currency used to have intrinsic value because it used to be made by and/or backed with precious metals. Government-backed cryptocurrencies, finally, are likely to have the status of legal tender (Goldsmith, 2020).

There are significant security issues that stall the further adoption of Bitcoin. In the words of Pflaum and Hateley (2014: 1194): *"for the potential benefits of disintermediation in financial services to be realized, regulatory authorities in the United States and elsewhere must address the risks posed by the*

regulatory gap that will be created by cutting out the middlemen". As safe as the code itself may be, there are still several security gaps to be covered, which harms the potential of Bitcoin. For example, the client side remains vulnerable to malicious actions. Digital wallets can be hacked and in the event of a user losing their credentials to their wallet, their private key, or the entire storage device where the wallet is kept, access to the cryptocurrencies is compromised. Additionally, the pseudoanonymity which Bitcoin provides can make it a haven for money laundering and other illicit activities (Drakopoulos, Natalucci, & Papageorgiou, 2021).

Another issue is the irreversibility of transactions. This is also an issue which stems from technical factors. It should, nevertheless, be noted that cash transactions are also difficult to reverse. Finally, due to the fact that cryptocurrency is not widely used as a numeraire, there is an exchange-rate risk, which exists as a risk in any currency exchanges. A factor in this is the incentive that exchange operators might have for fraud, which is also present in any exchanges and transactions.

To close this section, there is a wide range of opinions regarding the nature of cryptocurrencies and there has been no definitive conclusion. It can be argued that cryptocurrencies, especially Bitcoin, fulfill the functions and attributes of money as sufficiently as some of the world's currencies. If the aforementioned problematic features were to be fixed, there would be a need to re-examine the capabilities and the potential of Bitcoin to become generally accepted as money.

3. A Complicated Relationship with the Modern State

3.1 The political rise and fall of Bitcoin

The cryptocommunity was never apolitical or detached from activism. Decentralization is the embodiment of the libertarian dream of escaping governmental regulations and bypassing the need for decision-making central authorities in favour of individual sovereignty and free markets (Kostakis & Giotitsas, 2014).

By the 1990s, techno-libertarians and crypto-anarchists, more prominently the grassroots activist movement of Cypherpunks, were already dreaming of digital, government-free money as a means to skip the inefficient and parasitic middlemen that, in their book, were centralised institutions (Albano, 2019). Attempts to bring encryption to civil society had created significant political disputes. Consequently, it is no surprise that the birth of Bitcoin has been characterized as *"the apotheosis of the cypherpunk movement"* (Zarkadakis, 2020:101).

The birth of Bitcoin is deeply political, as it was connected to the financial crisis of 2008. It was promoted as money removed from political intervention and state and central bank monetary policy (Nakamoto, 2008). Some of the first supporters of Bitcoin were deeply politically motivated and intrigued by the idea of bypassing the state and building an anarchist society organized only by none other than the market. To them, the nascent project represented a challenge to territorial state-backed currencies (Hütten & Thiemann, 2017). In 2010, members of the Bitcoin community called for WikiLeaks to accept donations through Bitcoin with Wikileaks responding positively by 2011.

Suddenly, there was a wave of new non-governmental institutions and intermediaries coming to the foreground to become a part of the Bitcoin vision, with some even departing from it (e.g. Mt.Gox). The SilkRoad, a creation by Ross Ulbricht, a self-identified libertarian, was founded in 2011, functioned as a black-market vendor, incentivized by the potential of bitcoins to bypass regulations and was soon shut down by the Federal Bureau of Investigation (Hütten & Thiemann, 2017). To summarize, the rise of Bitcoin came with the support of libertarians, on both ends of the left-right political axis, and people who sought to avoid the law.

The following years, the ideological aspect was already toned down. The IT-sector took over the field, and Bitcoin took the form of a payment network rather than a political experiment against the monetary system. The original dream of decentralizing and redistributing wealth through Bitcoin, was now getting ever so distant, with the cost of mining skyrocketing, to the point where an individual user without significant funds and expertise would not be able to have any profits. There is now a blatant disconnection between the hypercapitalist speculative dimension of Bitcoin and the people-friendly rhetoric of independence from the evil middlemen. In response to that, there are a number of alternatives, commons-centered, and collaborative cryptocurrencies which attempt to lessen the capitalist angle of cryptocurrencies (Massumi, 2018).

Nowadays, Bitcoin can be characterized as “inherently apolitical” (Graf, 2013). While the governments have diminished the most deviant formations of the initial years, Bitcoin is now getting linked with the formal economy, bringing hopes of adoption while the original vision has been gradually toned down. At the same time, the idea of regulating Bitcoin has been gaining traction, after years of users experiencing Bitcoin as an instrument of criminal activities.

3.2 Cryptocurrency and state sovereignty

The development of the Internet in general raised concerns regarding the limits of a state's powers. The most prominent opinion seems to be that cyberspace is merely an extension of the physical world, and thus, the same legal rules should apply in this space as well, yet it poses security challenges. On the opposite side, it has been even argued by important cyberlibertarian activists that the traditional state governance models are not applicable on the Internet, claiming that the cyberspace is a separate extraterritorial space and that states are not authorized or able to regulate individuals there (Barlow, 1996).

To some, state sovereignty might appear to be threatened by new technologies and in need to be re-established in cyberspace. There have even been claims that the blockchain technology will weaken the Nation State (Manski & Manski, 2018). Aside from the issue of the capability of the State to regulate cyberspace, ultimately, the Internet has some characteristics (e. g. anonymous, dispersed) which halt regulation and enforcement. The dispersed nature of blockchain-based systems and their autonomy have as result the distribution and decentralization of authority, which in turn lead to an uncertain relationship with regulatory bodies and, eventually, the erosion of state sovereignty (Manski & Manski, 2018). Additionally, states become increasingly vulnerable to forces outside of their territorial jurisdictions, for instance, global tech-companies and other countries acting both directly and indirectly (European Political Strategy Centre, 2019), with the biggest companies acting like "Leviathans on a leash" (Ciepley, 2019). What should also be underlined is the fact that the crypto ecosystem is affected by different regulatory frameworks in different countries and, thus, international collaboration in cryptocurrency regulation becomes more challenging (Drakopoulos, Natalucci, & Papageorgiou, 2021). Private cryptocurrencies, such as Bitcoin, fall in a regulatory gray area (Goldsmith, 2020). It can also be forecasted that this domain is to keep developing, which means that more problems will arise.

We cannot predict future reactions, nonetheless, regardless of the legal status of cryptocurrencies within their jurisdiction, nations, transnational, and intergovernmental entities have had various stances on their existence.

3.3 Reactions and regulations from states and organizations

Despite the reluctant stance of the majority, there are a few countries that are embracing cryptocurrencies, some of them launching -or contemplating to launch- their own, government-backed cryptocurrencies. In August 2018 Venezuela created the Petro, a cryptocurrency backed by the

country's own oil and mineral reserves. Venezuelan president Nicolás Maduro enthusiastically introduced the cryptocurrency to the press, claiming that it would help the country "advance in issues of monetary sovereignty, to make financial transactions and overcome the financial blockade", referencing the sanctions enacted by the U.S. during 2017 (Ulmer & Buitrago, 2017). The U.S., Sweden, Japan and Estonia have also been reported to contemplate launching their own, while other governments, such as Tunisia, Dubai and the Marshall Islands have already issued cryptocurrencies (Goldsmith, 2020). Ukraine, on September 8th, 2021, adopted a bill to legalize and regulate all virtual financial assets, cryptocurrencies included while Cuba passed a law, with the aim of regulating cryptocurrencies "for reasons of socioeconomic interest" (Mellor, 2021). Most prominently, El Salvador is currently the only country in the world to accept Bitcoin as legal tender, since September 7th 2021 (Quiroz-Gutierrez, 2021).

On the exact opposite side, there have been multiple state actors warning against cryptocurrencies or fully prohibiting them withing their jurisdiction. Algeria (Freeman Law, n.d.) and Morocco (Freeman Law, n.d.) are among the ones that have chosen the strict approach of banning cryptocurrency, with transactions and exchanges being punishable by law.

In the European continent, both the European Central Bank and the European Banking Authority have been researching the risks of Bitcoin and their potential regulatory stance. The ECB has focused on aspects such as the risk to price stability, financial stability, the payment system, and reputational risks for central banks, concluding that the virtual currencies do not pose significant risks due to their limited use and low volume (Seetharaman, Saravanan, Patwa, & Mehta, 2017) The ECB warned in 2015 that on the event of virtual currencies becoming more interconnected with the international economic system, there would need to be an oversight framework (European Central Bank, 2015). In 2021, it was announced by the ECB that an investigation phase for a digital euro project is due to commence in October 2021. It has however been declared that this future digital euro is not going to be a crypto-asset and that it will be backed by the ECB (European Central Bank, n.d.). Its aim will be the fulfilment of the needs of the European citizens as well as the prevention of illegal activities and negative impacts on financial stability and monetary policy (European Central Bank, 2021).

The general G20 stance has been fully dismissive of cryptocurrencies being considered currencies. They insist on the term "crypto-assets", because of their lack of key attributes. They do not consider them important enough to pose a threat to the financial system but the leaders of the G20 have declared that they will apply the Financial Action Task Force standards to the use of cryptocurrencies to regulate

money laundering and terrorist financing. It should be noted that, according to a recent report of the FATF, only 74% of its members[4] have reported that they have passed the necessary laws or regulations regarding virtual assets and their service providers (Financial Action Task Force, 2021). The Financial Stability Board has committed to keep monitoring cryptocurrency markets. It is also recognized by the G20 that the technology of cryptocurrencies is potentially beneficial for increasing efficiency and inclusivity (Clarke, 2018).

In a recent G7 report, it is stated that the security of cyberspace is crucial to the resilience of supply chains, with criminal or geo-political risks. Emphasis is put on the need for more elaborate international standards for cybersecurity and the proposal of implementing a common framework for international cooperation regarding crypto assets (G7 Panel on Economic Resilience, 2021).

The International Monetary Fund, in a recent report, offered some insights and policy proposals regarding crypto assets. It encourages the implementation of existing global standards by national regulators and the coordination among regulators in order to efficiently enforce the necessary measures and overcome data gaps. Emphasis is given on stablecoins and their regulation in proportion to the risks they pose (International Monetary Fund, 2021).

Speculation and Conclusions

Cryptocurrency is a subject which dominated global news for the past decade. It is the image of a technologically advanced stateless future for some and of a dystopian capitalist dream for others. Even though it now lacks the initial political direction, it still sparks the interest of various academics who see its potential to be extremely disruptive in the future. Some even predict that, in less than a decade, any technical weaknesses will have been overcome (Zarkadakis, 2020).

Especially after the Covid-19 pandemic, digitalization is a growing trend. Blockchain, as a very popular technology, is very likely to be part of this process (Partanen, 2018). An increasingly digital era is a prime opportunity for the growth and popularity of cryptocurrencies and other digital currencies

[4] The FATF has 39 members, 37 of which are states (Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Denmark, Finland, France, Germany, Greece, Hong Kong, Iceland, India, Ireland, Israel, Italy, Japan, Republic of Korea, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Portugal, Russian Federation, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States) and 2 are regional organizations (European Commission, Gulf Co-operation Council) (Financial Action Task Force, n.d.).

that can become a long-term option. Blockchain is ideal for the advancement of cryptocurrencies due to its accessibility and scalability (Partanen, 2018).

It is also likely that, as the technical details are edited in order to fit the current needs and issues, so will be the features and values of cryptocurrencies. Right now, a viable cryptocurrency that matches the world's values would be taxed, it would not be anonymous, and it would most definitely not threat popular currencies or hope to act as legal tender (Partanen, 2018). Eventually, cryptocurrencies are struggling for their longevity and thus, they will strive to achieve peace with the regulatory entities. The principles that were so carefully intertwined with the coding of Bitcoin and made it so popular might become an obstacle in the future and the current programming might need to be modified. Even if at some point in time cryptocurrencies become completely institutionalized, and as their supporters will change in numbers and beliefs, it is yet rather unlikely that they might be able to successfully challenge legal tenders such as the US dollar on a large scale (Taskinsoy, 2018), but they might achieve to wipe out the deniers of their status as money.

But will cryptocurrencies threaten the modern state? At the moment, most states keep a safe distance from cryptocurrencies, never seeming to consider them a real challenge or a problem but not granting them legal tender status either. Regulation can appear as a double-edged sword because it will give cryptocurrencies an ounce of legitimacy, and it will bring them closer to the people. Regulatory clarity might not be enough to make cryptocurrencies a threat, however, if use of cryptocurrencies is facilitated by future regulations, it is not unlikely that the status of other currencies might appear undermined, thus shaking the sovereign authority (Reiners, 2020).

Cryptocurrencies, and blockchain in general, exist for a tiny glimpse in the history of humankind, which is a lot less than how long physical currency exists. After the initial years, the political manifesto, the haven for criminal activities, cryptocurrencies are coming into their own. Of course, there are notable obstacles on their way of becoming reliable options of currency for the public, but they are not going away. We have yet to see how they will develop in the following years, the technological advancements and innovations that will come into the picture by the end of this decade. This is a subject that needs to be revisited in future research, perhaps of a larger extent. Maybe cryptocurrencies are still far from being a threat to the status quo, but considering they are in a phase of constant evolution and progress, with numerous academics speculating and proposing measures for their advancement, we should not rule out the possibility.

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