

Effect of Bitcoin on the Discipline of International Law

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Abstract

In the new era, human beings have new tools to transfer their wealth, including their money. One of these tools is the use of the Internet. In the meantime, digital intermediaries for transfer are formed. It can be noted in digital currencies like bitcoin. Also, this study will investigate Legal problems facing Bitcoin in level of International and Legal solutions against with that in the level of international law.

Keywords: Bitcoin, International Law, Banning Bitcoin, FATF

I. INTRODUCTION

Influencing the legal laws in human life will make life better with feelings of security. The effects of money on human life on the one hand and The rules laid down to resolve the disputes on the other hand will cause Human always looking for the development of legal rules in their lives. Since human trade has long been shaped by simple laws and he needs a reliable exchange for trading in his own business, so first we focus on the issue of currency.

According to the traditional definition, a currency has three main properties: (i) it serves as a medium of exchange, (ii) it is used as a unit of account and (iii) it allows to store value. Along economic history, monies were related to political power. In the beginning coins were minted in precious metals. Therefore, the value of a coin was intrinsically determined by the value of the metal itself. Later, money was printed in paper bank notes, but its value was linked somewhat to a quantity in gold, guarded in the vault of a central bank. Nation states have been using their political power to regulate the use of currencies and impose one currency (usually the one issued by the same nation state) as legal tender for obligations within their territory. In the twentieth century, a major change took place: abandoning gold standard. The detachment of the currencies (specially the US dollar) from the gold standard meant a recognition that the value of a currency (especially in a world of fractional banking) was not related to its content or representation in gold, but to a broader concept as the confidence in the economy in which such currency is based. In this moment, the value of a currency reflects the best judgment about the monetary policy and the “health” of its economy.

In recent years, a new type of currencies, a synthetic one, emerged. We name this new type as “synthetic” because it is not the decision of a nation state, nor represents any underlying asset or tangible wealth source. It appears as a new tradable asset resulting from a private agreement and facilitated by the anonymity of internet. Among this synthetic currencies, Bitcoin (BTC) emerges as the most important one, with a market capitalization of 280 billion, as of December 2017. There are other cryptocurrencies, based on block chain technology, such as Litecoin (LTC), Ethereum (ETH), and Ripple (XRP). The website <https://coinmarketcap.com/currencies/> counts up to 641 of such monies. However, as we can observe in Figure 1, Bitcoin represents 89% of the capitalization of the market of all cryptocurrencies. One open question today is if Bitcoin is in fact a, or may be considered as a, currency. Until now, we cannot observe that Bitcoin fulfills the main properties of a standard currency. It is barely accepted as a medium of exchange (e.g. to buy some products online), it is not used as unit of account (there are no financial statements valued in Bitcoins), and we can hardly believe that, given the great swings in price, anyone can consider Bitcoin as a suitable option to store value. Given these characteristics, Bitcoin could fit as an ideal asset for speculative purposes. There is no underlying asset to relate its value to and there is an open platform to operate round the clock.

As of 2015, Bitcoin is the most popular electronic currency in the world. While Bitcoin supporters argue that electronic currency will play a significant role in the economy [2,9]. its critics note that the majority of this popularity is related to speculative trades [8,14,27]. Recent research on Bitcoin focuses on providing a better understanding about this new asset or currency. Major works include estimating Bitcoin’s impact on the existing monetary system [3,6,9] and examining Bitcoin’s price movements [4,5,20,27]. Yet, few papers look at a major issue related to the long term potential of Bitcoin – whether this new currency can generate some economic benefits. While Bitcoin supporters argue that the decentralized and deregulated feature of Bitcoin will provide lower transaction costs to its users, this claim has not been empirically tested thus far [3]. Further, the fact that it is deregulated is often thought of regarding its potential to save transaction costs only in illegal transactions. In order to be widely accepted as a method of payment, Bitcoin must provide lower transaction costs in above board and legal transactions.

Although there are more than 3000 cryptocurrencies in Circulation to this day, bitcoin has been the leader in terms of valuation and usage since introduced back in early 2009. But what does cryptocurrency mean?

Dividing the word in its two etymological roots, the crypto refers to the cryptographic protocol used by Bitcoin to eliminate the “double spending” paradox. The currency refers to its relation to the Bitcoin ecosystem, i.e., bitcoin is the unofficial money of the Bitcoin global community. More than money as regularly conceptualized, bitcoin is simply a unit of account or ledger, numbers in a computer screen exchanged online when traded from one party to another. Like physical cash, bitcoin is anonymous in the sense that it cannot be traced back to a particular individual. However, it is not fully anonymous (i.e., pseudo-anonymous [Fig.1]) because transactions are publicly and chronologically registered in the “blockchain” (e.g., how many and at what time), albeit the owner of the transaction remains anonymous.

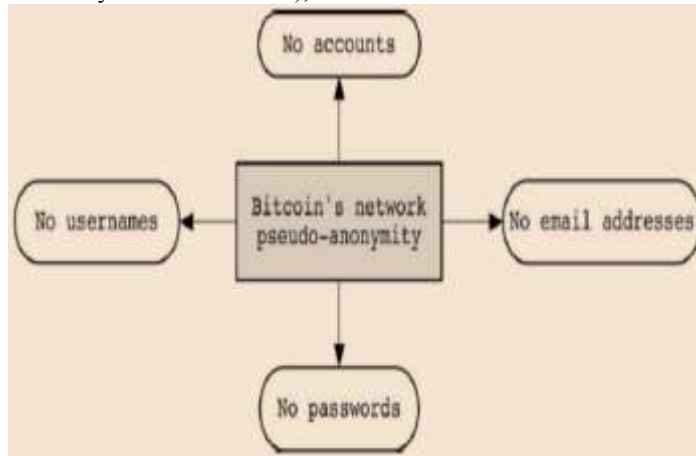


Figure 1: Integrated Bitcoin Network Pseudo-anonymity

Source: Diagrammatic interpretation by Villarreal, 2016.

So, in this paper, we will investigate the legal problems that bitcoin currency causes. For this purpose, we will examine the Forty Recommendations that Financial Action Task Force on money laundering (FATF) proposed. At the rest of this article, in the second part “the literature review”, in the third part “theoretical framework”, in the fourth section “data and research findings” and in the fifth part “conclusions and suggestions” will be presented.

II. BRIEF LITERATURE REVIEW

A. Bitcoin

Speculation has a long history and it seems inherent to capitalism. One common feature of speculative assets in history has been the difficulty in valuation. Tulipmania, the South Sea bubble, and more others, reflect on one side human greedy behavior, and on the other side, the difficulty to set an objective value to an asset. All speculative behaviors were reflected in a super-exponential growth of the time series [13]. Cryptocurrencies can be seen as the libertarian response to central bank failure to manage financial crises, as the one occurred in 2008. Also cryptocurrencies can bypass national restrictions to international transfers, probably at a cheaper cost. Bitcoin was created by a person or group of persons under the pseudonym Satoshi Nakamoto. The description of Bitcoin Core, i.e. the open source client of the Bitcoin cryptocurrency, is described in [22]. The discussion of Bitcoin has several perspectives. The computer science perspective deals with the strengths and weaknesses of blockchain technology. In fact, according to [21], the introduction of a “distributed ledger” is the key innovation. Traditional means of payments (e.g. a credit card), rely on a central clearing house that validate operations, acting as “middleman” between buyer and seller. On contrary, the payment validation system of Bitcoin is decentralized. There is a growing army of miners, who put their computer power at disposal of the network, validating

transactions by gathering together blocks, adding them to the ledger and forming a 'block chain'. This work is remunerated by giving the miners Bitcoins, what makes (until now) the validating costs cheaper than in a centralized system. The validation is made by solving some kind of algorithm. With the time solving the algorithm becomes harder, since the whole ledger must be validated. Consequently it takes more time to solve it. Contrary to traditional currencies, the total number of Bitcoins to be issued is beforehand fixed: 21 million.

In fact, the issuance rate of Bitcoins is expected to diminish over time. According to [1] validating the public ledger was initially rewarded with 50 Bitcoins, but the protocol for see halving this quantity every four years. At the current pace, the maximum number of Bitcoins will be reached in 2140. Taking into account the decentralized character, Bitcoin transactions seem secure. All transactions are recorded in several computer servers around the world. In order to commit fraud, a person should change and validate (simultaneously) several ledgers, which is almost impossible. Additionally, ledgers are public, with encrypted identities of parties, making transactions "pseudonymous, not anonymous" [7].

The legal perspective of Bitcoin is fuzzy. Bitcoin is not issued, nor endorsed by a nation state. It is not an illegal substance. As such, its transaction is not regulated.

B. Law problems of bitcoin

Bitcoins are stored in "digital wallets," which are not insured by the FDIC*. Therefore, any Bitcoins in your digital wallet are not truly protected. In real terms, any Bitcoins in your digital wallet are not insured by the United States government against that digital wallet company going out-of-business. Bitcoin transactions are anonymous in the sense that each transaction is tied to the "digital wallet ID," rather than the user's actual name and identity. Not having actual names tied to the transaction is primarily why marketplaces specializing in the sale of illegal products and services, like the "now defunct Silk Road," accept Bitcoin as payment.

Bitcoin and other cryptocurrencies have a number of characteristics that make it different from traditional money. First, most major credit card companies will impose a transaction fee of around 3%, while Bitcoin allows individuals and merchants to transact directly with one another without a fee, thus lowering the overall cost of the transaction. Unlike the U.S. Dollar, Bitcoins cannot be printed infinitely. The amount of Bitcoin that can be mined is capped at 21 million. A direct power of Congress under Article I of the U.S. Constitution is the authority "to coin Money" and "regulate the Value thereof" and thus may provide oversight and control of cryptocurrencies.

A notice issued by the Internal Revenue Service back on March 25, 2014 provided that virtual currency is treated as property for U.S. federal tax purposes. Cryptocurrencies apply the same general property transaction tax principles. Cryptocurrency wages are taxable to the employee, must be reported by the employer on a W-2 Form, and are subject to federal income tax withholding and payroll taxes. Payments to independent contractors with cryptocurrencies are also taxable and self-employment tax rules generally apply. Gain or loss from the sale or exchange of cryptocurrency depends on whether the virtual currency is a capital asset in the hands of the particular taxpayer. Finally, any payments made with virtual currency are subject to information reporting to the same extent as any other payment made in property.

Under title 18 U.S.C. Sections 470-477 and 485-489, counterfeiting and forging of U.S. coins, currency, and obligations is subject to criminal sanctions, and under 18 U.S.C. Sections 478-483, counterfeiting foreign coins, currency, and obligations also subject to criminal sanctions. However, nothing expressly applies to a currency in digital form. At least one case involved a conviction for issuing and circulating "Liberty Dollars." Liberty Dollars were similar but different in design from U.S. dollars and were intended to "limit reliance on, and to compete with, United States currency." Whether the United States

1) Federal Deposit Insurance Corporation

government can prosecute for use of cryptocurrency under one of the counterfeiting criminal statutes is quite unclear [12].

The Electronic Transfer Fund Act (ETFA), 15 U.S.C. Sections 1693, applies to transfers of money electronically, but is limited and does not appear to be applicable to a digital currency without a financial institution involved. The Act applies to transfers of funds initiated by electronic means from a consumer's account held at a financial institution. Since cryptocurrencies use a peer-to-peer network, thus eliminating the need for a financial institution, this section is unlikely to apply.

The Stamps Payments Act criminalizes the issuance, circulation, or pay out of "any note, check, memorandum, token or other obligation, for a less sum than \$1, intended to circulate as money or to be received or used in lieu of lawful money of the United States." The language seems to apply to tangible forms of currency rather than cryptocurrency, but if Bitcoin or another cryptocurrency were to become a legitimate competitor of the U.S. Dollar, this statute might apply [12]. Engaging in financial transactions that involve proceeds of illegal or terrorist activities (or designed to finance such activities) is prohibited under federal criminal anti-money laundering laws. The Bank Secrecy Act (BSA) imposes record-keeping requirements on financial institutions to fight these illegal and terrorist-related financial transactions. All "money services businesses" (MSBs) must implement anti-money laundering programs to identify and stop such crimes, and MSBs must also file reports of cash transactions exceeding \$1,000.

Currency dealer or exchanger, check casher, issuer of traveler's checks, money orders, or stored value, seller or redeemer of traveler's checks, money orders or stored value, money transmitter, and U.S. Postal Service all fall under the umbrella of MSBs. Businesses and individuals that change Bitcoin into U.S. Dollars, or other foreign currency, must register with the Department of Treasury and comply with BSA reporting requirements.

In August 2013, the U.S. District Court for the Eastern District of Texas held that it had subject matter jurisdiction over possible fraud in investments purchased with Bitcoin, based on the court's finding that investments purchased with Bitcoin are securities. This ruling may subject all investments purchased with Bitcoin to SEC regulations.

"Unfair or deceptive acts or practices in or affecting commerce" are prohibited by the Federal Trade Commission (FTC) Act. This act applies to cryptocurrencies. On September 15, 2014, the FTC brought a civil action under the FTC Act against a company called Butterfly Lab in the U.S. District Court for the Western District of Missouri and charged the company with engaging in deceptive practices in violation of Section 5(a) of the FTC Act. The complaint alleged that Butterfly misled consumers who prepaid for Bitcoin mining machines and that these upfront payments amounted to thousands of dollars. The result of this case was that consumers could not produce Bitcoins, Butterfly was unjustly enriched, and the court had to intervene to stop a continuing substantial injury to consumers [12].

C. Banning Bitcoin

Today, with the advancement of technology, the activities of organized crime groups are in line with that, with the activities of these organizations, which include Money laundering, Currency smuggling and counterfeit banknotes, Illegal drug trade, Cybercrime, Bribery, Human trafficking, Identity theft, Kidnapping, Arms trafficking, Political corruption and it has also entered the Internet, including Bitcoin digital currency.

In fact, with the advancement of technology, in particular, the provision of criminals to the computer and the Internet; the cleansing of the proceeds of crime has also become more complex and new dimensions. The US Justice Department has said that \$ 10 billion worth of bank money is being stolen every year by committing computer crimes. However, cybercriminals are not limited to stealing money, but they also resort to computer crimes to conceal illegal proceeds from committing a crime. An estimated \$ 1 billion in illicit capital flows in the global financial markets every day. Foreign banks, in particular, are hurting developing nations, because they deprive them of the proceeds from the money they are being cleaned

out. The perpetrators easily cleanse these funds without their perpetrators being discovered because they are cleansed among very large amounts and transactions [18].

Thus, the activities of organized crime groups are classified into money laundering, and internationally and global, governments are trying to coordinate and collaborate in dealing with the implementation of two international conventions that include United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988 and the other one is United Nations Convention against Transnational Organized Crime and the Protocols Thereto (Palermo Convention) Which today Palermo Convention is the most comprehensive and recent international document in the fight against the definition of organized crime. The Mérida chapter of the United Nations Convention against Corruption also addresses the issue of money laundering. In this context, it is necessary to mention articles from the United Nations Convention [25] against Transnational Organized

Article 2. Use of terms

For the purposes of this Convention:

(a) "Organized criminal group" shall mean a structured group of three or more persons, existing for a period of time and acting in concert with the aim of committing one or more serious crimes or offences established in accordance with this Convention, in order to obtain, directly or indirectly, a financial or other material benefits; (b) "Serious crime" shall mean conduct constituting an offence punishable by a maximum deprivation of liberty of at least four years or a more serious penalty; (c) "Structured group" shall mean a group that is not randomly formed for the immediate commission of an offence and that does not need to have formally defined roles for its members, continuity of its membership or a developed structure; (d) "Property" shall mean assets of every kind, whether corporeal or incorporeal, movable or immovable, tangible or intangible, and legal documents or instruments evidencing title to, or interest in, such assets; (e) "Proceeds of crime" shall mean any property derived from or obtained, directly or indirectly, through the commission of an offence.

Article 3. Scope of application

1. This Convention shall apply, except as otherwise stated herein, to the prevention, investigation, and prosecution of: (a) The offences established in accordance with articles 5, 6, 8 and 23 of this Convention; and (b) Serious crime as defined in article 2 of this Convention; where the offence is transnational in nature and involves an organized criminal group.

2. For the purpose of paragraph 1 of this article, an offence is transnational in nature if:

(a) It is committed in more than one State;
(b) It is committed in one State but a substantial part of its preparation, planning, direction or control takes place in another State;
(c) It is committed in one State but involves an organized criminal group that engages in criminal activities in more than one State, or (d) It is committed in one State but has substantial effects in another State.

Article 5. Criminalization of participation in an organized criminal group

1. Each State Party shall adopt such legislative and other measures as may be necessary to establish as criminal offenses, when committed intentionally: (a) Either or both of the following as criminal offenses distinct from those involving the attempt or completion of the criminal activity:

(i) Agreeing with one or more other persons to commit a serious crime for a purpose relating directly or indirectly to the obtaining of a financial or other material benefit and, where required by domestic law, involving an act undertaken by one of the participants in furtherance of the agreement or involving an organized criminal group; (ii) Conduct by a person who, with knowledge of either the aim and general criminal activity of an organized criminal group or its intention to commit the crimes in question, takes an active part in:

a. Criminal activities of the organized criminal group;

b. Other activities of the organized criminal group in the knowledge that his or her participation will contribute to the achievement of the above-described criminal aim;

(b) Organizing, directing, aiding, abetting, facilitating or counseling the commission of a serious crime involving an organized criminal group. 2. The knowledge, intent, aim, purpose or agreement referred to in paragraph 1 of this article may be inferred from objective factual circumstances.

3. States Parties whose domestic law requires the involvement of an organized criminal group for purposes of the offenses established in accordance with paragraph 1 (a) (i) of this article shall ensure that their domestic law covers all serious crimes involving organized criminal groups. Such States Parties, as well as States Parties whose domestic law requires an act in furtherance of the agreement for purposes of the offences established in accordance with paragraph 1 (a) (i) of this article, shall so inform the Secretary-General of the United Nations at the time of their signature or of deposit of their instrument of ratification, acceptance or approval of or accession to this Convention [25]. Given the above, money laundering is completely criminalized internationally. Also Financial Action Task Force on Money Laundering-FATF an organization of cooperation between governments created to combat money laundering. The main goal of this union is, in fact, to fight against the illicit activities that affect the economic sectors of the countries.

Currently, the FATF consists of 29 countries and two international organizations (the EU and the Gulf Cooperation Council), and members of the union include countries that are considered to be major financial centers of the world. The FATF has a set of 40 articles that deal with all aspects Money laundering campaign. From the beginning of the FATF activity, it became apparent that the member countries of the union had different legal and financial systems and could not meet the same criteria and follow the behavioral measures to combat money laundering. Thus, the FATF Executive Order was written in the same way it can also be implemented by all members, but does not restrict the legal transactions of member states and prevent the development of economies in countries. FATF members are: Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Denmark, European Commission, Finland, France, Germany, Greece, Gulf Co-operation Council, Hong Kong, China, Iceland, India, Ireland, Italy, Japan, The Republic of Korea, Kingdom of the Netherlands (comprises Netherlands, Aruba, Curacao and Sint Maarten, Luxembourg, Malaysia, Mexico, New Zealand, Norway, Portugal, Russian Federation, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, The United Kingdom, United States [11]. FATA has 40 Recommendations. The 40 Recommendations provide a complete set of counter-measures against money laundering (ML) covering the criminal justice system and law enforcement, the financial system and its regulation, and international cooperation. Considered at The Forty Recommendations of the Financial Action Task Force on Money Laundering 1990 is as follows:

Article 3. An effective money laundering enforcement program should include increased multilateral cooperation and mutual legal assistance in money laundering investigations and prosecutions and extradition in money laundering cases, where possible.

Article 7. Where possible, corporations themselves - not only their employees - should be subject to criminal liability.

Article 9. Recommendations 12 to 29 of this paper should apply not only to banks, but also to non-bank financial institutions.

Article 12. Financial institutions should not keep anonymous accounts or accounts in obviously fictitious names: they should be required (by law, by regulations, by agreements between supervisory authorities and financial institutions or by self-regulatory agreements among financial institutions) to identify, on the basis of an official or other reliable identifying document, and record the identity of their clients, either occasional or usual, when establishing business relations or conducting transactions (in particular opening of accounts or passbooks, entering into fiduciary transactions, renting of safe deposit boxes, performing large cash transactions).

Article 14 Financial institutions should maintain, for at least five years, all necessary records on transactions, both domestic or international, to enable them to comply swiftly with information requests from the competent authorities. Such records must be sufficient to permit reconstruction of individual transactions (including the amounts and types of currency involved if any) so as to provide, if necessary, evidence for the prosecution of criminal behavior. Financial institutions should keep records on customer identification (e.g. copies or records of official identification documents like passports, identity cards, driving licenses or similar documents), account files and business correspondence for at least five years after the account is closed. These documents should be available to domestic competent authorities in the context of relevant criminal prosecutions and investigations.

Article 15. Financial institutions should pay special attention to all complex, unusual large transactions, and all unusual patterns of transactions, which have no apparent economic or visible lawful purpose. The background and purpose of such transactions should, as far as possible, be examined, the findings established in writing, and be available to help supervisors, auditors and law enforcement agencies.

Article 24. Countries should consider the feasibility and utility of a system where banks and other financial institutions and intermediaries would report all domestic and international currency transactions above a fixed amount, to a national central agency with a computerized database, available to competent authorities for use in money laundering cases, subject to strict safeguards to ensure proper use of the information.

Article 30. National administrations should consider recording, at least in the aggregate, international flows of cash in whatever currency, so that estimates can be made of cash flows and reflows from various sources abroad, when this is combined with central bank information. Such information should be made available to the IMF and BIS to facilitate international studies.

Article 38. There should be an authority to take expeditious action in response to requests by foreign countries to identify, freeze, seize and confiscate proceeds or other property of corresponding value to such proceeds, based on money laundering or the crimes underlying the laundering activity. There should also be arrangements for coordinating seizure and confiscation proceedings which may include the sharing of confiscated assets.

Article 40. Countries should have procedures in place to extradite, where possible, individuals charged with a money laundering offense or related offenses. With respect to its national legal system, each 6 countries should recognize money laundering as an extraditable offense. Subject to their legal frameworks, countries may consider simplifying extradition by allowing direct transmission of extradition requests between appropriate ministries, extraditing persons based only on warrants of arrests or judgments, extraditing their nationals, and/or introducing a simplified extradition of consenting persons who waive formal extradition proceedings [23].

The UK and other European governments have also announced that all responsible organizations will be obliged to take decisive steps as soon as possible on Bitcoin. Therefore, it seems that Britain, in cooperation with the European Union, intends to make more serious decisions towards Bitcoin and the emergence of other Adopt digitally encrypted currencies. On the other hand, because the bitcoin digital currency is facilitating money laundering, financial mismanagement and terrorist activities, it also means money laundering, tax evasion and illicit trade such as the sale and purchase of weapons, drugs and terrorist equipment, and it is not possible to prevent this new phenomenon in general, but it is possible to restrict its use and it can be controlled by new rules, so it is necessary to enforce laws so that traders, brokers, and parties to the transaction in exchange for the bitcoin currency have to enter their information. Therefore, Identity, name and the exact address of traders to prevent money laundering and other illegal activities must be recorded.

A remarkable point in this regard is that with the passage of time and that the wealth of the world is only available to 10% of today's society, and developing countries face a lot of financial problems and poverty and hunger on the one hand and Losses of natural factors such as earthquakes and volcanoes, on the other

hand, comes into existence Rapid Turbulence and international irregularities and the relations of governments with each other, As that bitcoin as well in the absence of control, unlimited accretion Its bubble price, can be disturbs this financial balance, increase Criminally governments and financial institutions for speculative purposes.

III. THEORITICAL BENCHMARK

For a comparison and ranking between BTC and other varieties of money relative to the 8 ontological qualities, see Table 1.

Table 1: Ontological Qualities Comparison of Money Types

	BTC	US dollars	Gold	Treasury Bills	Bank checks	Ox
Fungible	1	1	1	1	0	1
Durable	1	-	1	0	0	-
Portable	1	1	-	1	1	0
Divisible	1	1	1	0	0	0
Tangible	0	1	1	1	1	1
Recognizable	0	1	0	1	1	1
Scarce	1	0	1	0	0	-
Liquid	-	1	0	1	1	0
Aggregates	5	6	5	5	4	3

Scores: 1 = yes (positive), 0 = no (negative), - = relative (neutral).

From the table above we can clearly acknowledge bitcoin's potentiality as a parallel or substitute to bank issued money, the one type of money with the highest aggregate score. Albeit bitcoin's absence of tangibility and recognizability are no match to paper money or gold, both ontological qualities simultaneously yield a spatiotemporal freedom not afforded by any other form of money. It is only the liquidity (i.e., ubiquity of exchange) quality then, where fiat money has an advantage over bitcoin, understandable fact because the cryptocurrency has only been circulating since 2009. Within several years, *ceteris paribus*, bitcoin not only can match the liquidity levels of paper based money, but even surpass it.

As cryptocurrency, bitcoin qualifies as medium of exchange, or as Nakamoko 2008 called it "peer-to-peer version of electronic cash". These two qualities suggest bitcoin's potential value, composed of its scarcity and utility [Fig. 2]. Bitcoin has a limit of approximately 21 million BTC units to ever be issued [22]. A new "block" with a set number of bitcoins, which are cut in half every 4 years, is mined every 10 minutes. Every bitcoin is divisible to 1/100 million units, commonly referred as a Satoshi. [19].

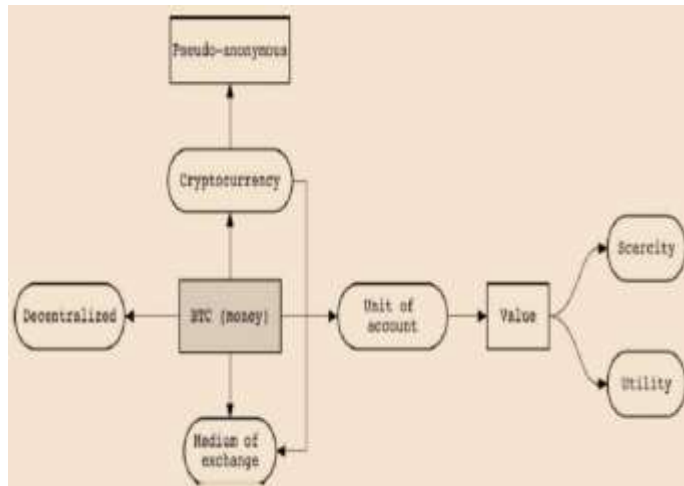


Figure 2: BTC Potential Value as Money

Source: Nakamoto, 2008. Diagrammatic interpretation by Villarreal, 2016.

Another peculiarity of Bitcoin's protocol is the decentralization of the issuing or "mining" of bitcoins, this performed by the global network of "nodes" [Fig3]. Contrary to standard banking practice, bitcoin is issued privately by individual users. In modern capitalistic economies, central banks or private banks issue money, with monopoly power over its creation and policies, and authority to legally punish anyone attempting to issue private money. This dilemma has caused much controversy to the legal establishment in the US and other countries around the world. No international consensus has been achieved; bitcoin still exists for the most part in an identity legal limbo of money vs. property vs. commodity

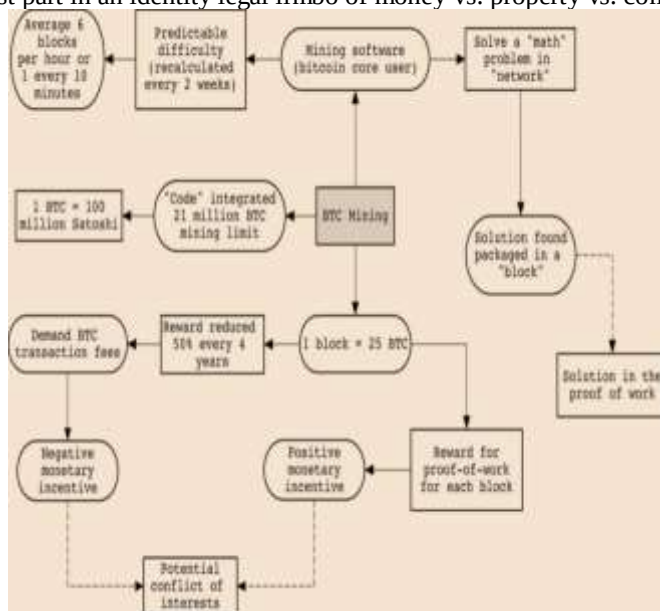


Figure 3: Bitcoin Mining Process

Source: Nakamoto, 2008. Diagrammatic interpretation by Villarreal, 2016.

Starting from the basics, Bitcoin with capital “B” [Fig 4] refers to the protocol, the community or ecosystem, the cryptocurrency, and the “code”. Bitcoin with lower “b” or “BTC” [Fig 5], however, refers to the cryptocurrency (i.e., money) exclusively. Both terms will be used contextually throughout the development of this work.

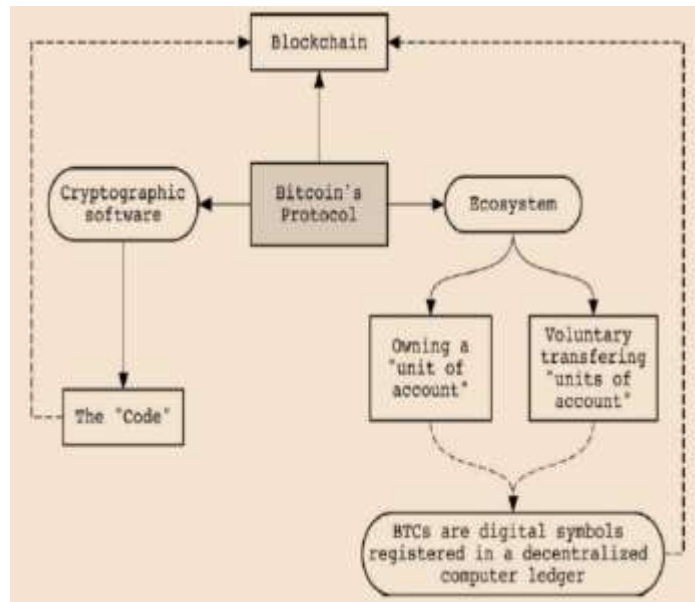


Figure 4: Bitcoin's Protocol

Source: Nakamoto, 2008. Diagrammatic interpretation by Villarreal, 2016.

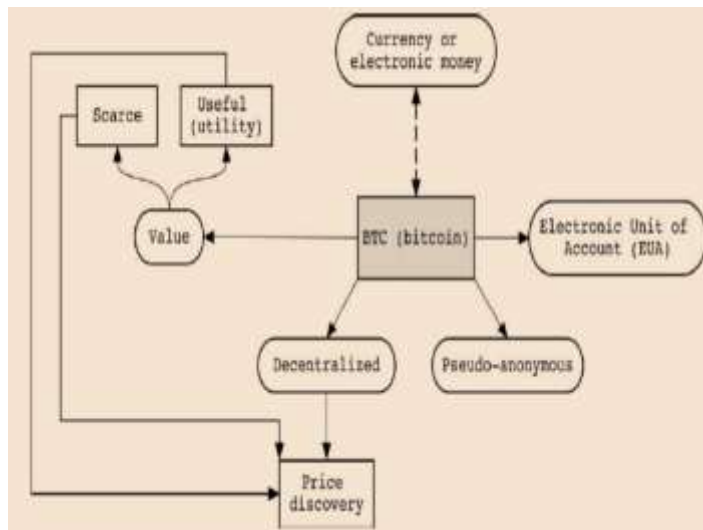


Figure 5: Bitcoin as Cryptocurrency (bitcoin or BTC)

Source: Nakamoto, 2008. Diagrammatic interpretation by Villarreal, 2016.

IV. DATA AND RESEARCH FINDINGS

A. GLOBAL EXCHANGE OF BITCOIN

The data used for the analysis comes from several online resources specialized in Bitcoin. As of December (2017) [13], 16,731,000.00 BTC have been mined (i.e., issued) since its inception in 2009 [Fig. 6]. Not all mined bitcoins are in circulation, some are saved for future use (i.e., storage of value) or as hedge against currency volatility; others have been lost to technical glitches or user carelessness.

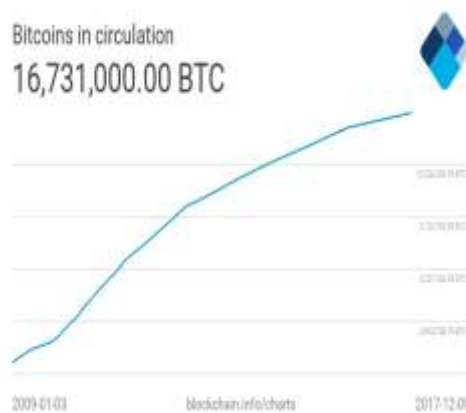


Figure 6: Total Bitcoins Mined (2009-2017)

Source: ©2017 Blockchain Ltd. Retrieved December 11, 2017 (blockchain.info/charts/totalbitcoins)

This global aggregate equates to a market capitalization of 248.8 billion US dollars [Fig. 7]. Parity exchange value relative to US dollars has increased in the past 3 years, currently trading at \$16,433.58 US dollars per one BTC.

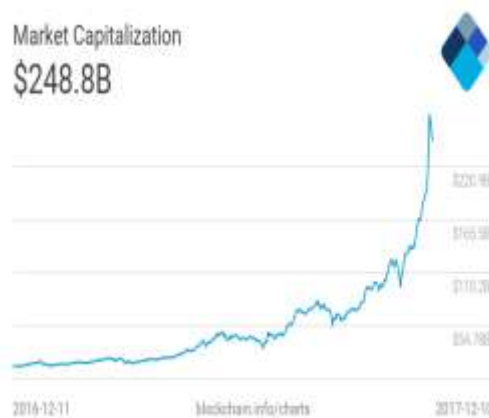


Figure 7: Bitcoin Market Capitalization (2009-2017)

Source: ©2017 Blockchain Ltd. Retrieved December 11, 2017 (blockchain.info/charts/marketcap)

Bitcoin global transactions reached 403,399 in the last 24 hours [Fig. 8, see below], or approximately 16,808 per hour. Since mid-2012, bitcoin transactions per day have been constantly growing in a steady positive slope. Though transaction volume volatility can be quite dramatic (e.g., 50% decline or jump within one week), trust in the cryptocurrency's ecosystem and bitcoin's code has successfully overcome these wild swings. Much of the volatility can be attributed to fraud and malicious hacks on exchange servers (traders and consumers panicking to collect their BTCs), rather than extinction of confidence or some form overtly perverse institutional intervention in the cryptocurrency's ecosystem operation. There seems no systematic or asymmetric reason for bitcoin stopping its effervescent expansion to legitimization as everyday reality money.



Figure 8: Total Bitcoin Transactions per Day (2009-2017)

Source: © bitcoincharts.com. Retrieved December 11, 2017 (blockchain.info/charts/ntransactions)

V. CONCLUSIONS AND OFFERS

The years of easy money [16] and quick economic patching are coming to an end. In the developed world, when ZIRP (Zero Interest-Rate Policy) lost its monetary *magic*, NIRP (Negative Interest-Rate Policy) came to the rescue. But to rescue who? NIRP is the embodiment of legalized extraction of wealth, not for society but against it. There are 25 countries (5 different currencies) using this draconian policy [17], two years ago it was not even under the radar. What we are witnessing is not the typical boom-and-bust economic cycle, but a systemic crisis of capitalism [26]. Why should we care about ZIRP or NIRP? What do they have to do with bitcoin? Access to goods and services in a market economy is a function of each actor's purchase power, itself dependent to two conditions: the amount of money (i.e., universal commodity) in control by the actor, and the exchange-value of the actual money (e.g., how much you can trade for a dollar now and a year from today). Zero and negative interest-rate policies diametrically affect the actor's purchase power. Consequently, limiting and reducing access to necessary goods and services. Without diving deeper into the mechanics of interest rates and purchasing power, neoliberal capitalism, in collusion with central banking, is keeping itself alive by subtracting wealth from society via asset confiscation, albeit disguised as "negative interest rates", a ludicrous misnomer.

As mentioned in previous parts, bitcoin's ambivalent personality appears as a savior of capitalism and its nemesis. On the one hand, bitcoin can save capitalism as hedge against worthless paper money, paradoxically via detaching itself from conventional models of monetary operation.

Whereas earlier studies consider the size of government necessary to prevent an item from functioning as money, we extend the analysis by acknowledging that governments can—and often do—punish their subjects. Our results call into question the view that only a large government can stymie an alternative to its preferred money. A government can prevent an alternative from circulating if it is willing and able to mete out sufficiently severe punishments. More generally, our approach suggests that sovereignty—that is, the ability of some agents to govern the behavior of others—is a function of both size and power. Our work contributes to the existing literature in two ways. First, it more fully endogenizes the decisions of private agents. Whereas, in earlier works, the subset of agents employing the exogenous transactions policy could be interpreted to include *private* agents acting in accordance with the policy, we restrict this group to *government* agents and provide a mechanism—explicit punishments—whereby government agents might coerce private agents into following the policy. Second, the policies employed by the government agents in our model more closely resemble those considered by actual governments.

In Russia and elsewhere, proposals to prevent bitcoin and other alternative currencies from circulating have not been limited to transactions policies. They also include specific punishments for those caught creating, issuing, or circulating rivals to the government's preferred money. The approach taken here suggests several avenues for future research. We have taken it for granted that a government wants to ban bitcoin; that some private agents would like to use the official government currency; and that some private agents would like to use bitcoin. Although others have considered the motivations for banning or transacting with bitcoin, no one to our knowledge has attempted to include the relevant frictions necessary to derive these positions in a money matching model. We also take it for granted that governments have access to a punishment technology and, indeed, implicitly assume there is no limit to the severity of punishments a government might levy. Surely there are political economy considerations that constrain the most severe punishments. Although these issues are beyond the scope of this article, we hope our work will encourage others to start thinking about such questions.

Though still quite volatile, consumers around the world acknowledge bitcoin as an alternative universe of wealth preservation, or as “digital metallism” [20]. This wealth preservation quality, combined with the politics of community and trust (embodied in the “code”), endow bitcoin with objective exchange value. On the other hand, though not necessarily today, BTC can evolve into what Antonopoulos metaphorically calls “the internet of money”. The analogy between Bitcoin and the Internet is evident to the one elemental feature that defines them as revolutionary: decentralization. No one owns it, no one controls it. The Internet is open to everyone, it leveled the field to communize [28] knowledge, education, and intellectual property. It shattered the barriers of time, distance, and cultural isolation. Bitcoin has similar (and dangerous) qualities: uniting countries instead of dividing, democratizing money, making it transparent, ubiquitous, and free of spatiotemporal constraints, of coercive laws, of parasitic monetary cartels. The future of bitcoin may be the destiny of capitalism, hence this antagonistic dynamic yielding a new synthesis, Bitcoinism. Moving beyond the dystopian versus utopian rhetorical clash of modern neoliberal economics, no one knows what fate the cosmos has in store for us.

REFERENCES

- A. Laursen, J. H. Kyed, Virtual currencies, Danmarks Nationalbank Monetary Review 1st. Quarter (2014) 85–90.
- Bernanke, B., (2013) Federal Reserve Board Chairman's Letter to the Senate.

- Böhme, R. , Christin, N. , Edelman, B. , Moore, T. , 2015. Bitcoin: economics, technology, and governance. *J. Econ. Perspect.* 29, 213–238.
- Brandvold, M. , Molnar, P. , Vagstad, K. , Valstad, O. , 2015. Price discovery on Bitcoin exchanges. *J. Int. Financial Markets Inst. Money* 36, 18–35 .
- Cheah, E. , Fry, J. , 2015. Speculative bubbles in Bitcoin markets? An empirical investigation into the fundamental value of Bitcoin. *Econ. Lett.* 130, 32–36 .
- Dwyer, G. , 2015. The economics of Bitcoin and similar private digital currencies. *J. Financial Stab.* 17, 81–91 .
- E. V. Murphy, M. M. Murphy, M. V. Seitzinger, Bitcoin: Questions, Answers, and Analysis of Legal Issues, CRS Report 7-5700, Congressional Research Service, 2015. URL: digital.library.unt.edu/ark:/67531/metadc743363/.
- Glaser, F. , Zimmerman, K. , Heferkon, M. , Weber, M. , Siering, M. , 2014. Bitcoin - Asset or Currency? Revealing Users' Hidden Intentions. Goethe University working paper .
- Harvey, C., 2015. CRYPTOFINANCE. Duke University Working Paper.
<https://blockchain.info/> Retrieved informations, December 11, 2017.
<https://www.fatf.gafi.org/media/fatf/documents/FINAL%20FATF%20MANDATE%202012-2020.pdf>
<https://heitnerlegal.com/2017/07/18/some-background-on-legal-issues-surrounding-bitcoin-and-other-cryptocurrencies>. Retrieved December 11, 2017.
- J. A. Feigenbaum, P. G. O. Freund, Discrete scale invariance in stock markets before crashes, *International Journal of Modern Physics B* 10 (1996) 3737–3745.
- Krugman, P., (2013) Golden cyberfettlers. *New York Times*, September 7.
- Kim, T. , 2015. The predecessors of Bitcoin and their implications for the prospect of virtual currencies. *PLoS One* 10 (4) .
- Kaul, V. (2014). *Easy Money: evolution of the global financial system to the great bubble burst*. Los Angeles: SAGE Publications Inc., 2014.
- Kotok, D. (2016). "The Spreading Tentacles of NIRP". *Financial Sense*. Retrieved June 6, 2016 (www.financialsense.com/contributors/david-kotok/spreading-tentacles-nirp)
- Louise I. Shelley, Crime and Corruption in Digital age, *JOURNAL OF INTERNATIONAL AFFAIRS*, Spring 1998, 51, p.238; www.american.edu/traccc/centers/washington/washresr.htm
- Mining: The process of adding transaction records to Bitcoin's public ledger of past transactions. Also, the mechanism used to introduce bitcoins into the system. Miners are paid any transaction fees as well as a "subsidy" of newly created coins. Retrieved June 9, 2016 (en.bitcoin.it/wiki/Mining)
-Formula: 1 Satoshi = 1/100 million bitcoin units (i.e., 1:0.00000001). Retrieved June 9, 2016 ([en.bitcoin.it/wiki/Satoshi_\(unit\)](http://en.bitcoin.it/wiki/Satoshi_(unit)))
- Maurer, B., Nelms, T. C., & Swartz, L. (2013). "When perhaps the real problem is money itself!": the practical materiality of Bitcoin. *Social Semiotics*, Vol. 23. No. 2, 261-277.
- R. Ali, J. Barrdear, R. Clews, J. Southgate, The economics of digital currencies, *Bank of England Quarterly Bulletin* 54 (2014) 276–286.

- S. Nakamoto, Bitcoin: A peer-to-peer electronic cash system, <https://bitcoin.org/bitcoin.pdf/>, 2009. Accessed: 2016-12-27.
- The Forty Recommendations Of The Financial Action Task Force On Money Laundering, 1990 (www.michaelnielsen.org/ddi/how-the-bitcoin-protocol-actually-works) For a comprehensive list of Bitcoin communities, visit: bitcoin.org/en/community.
- United nations office on Drugs and Crime (<https://www.unodc.org/unodc/en/organized-crime/intro/UNTOC.html>)
- Xie, A. (2016). "Don't listen to the ruling elite: the world economy is in real trouble". South China Morning Post. Retrieved June 6, 2016 (<http://www.scmp.com/comment/insightopinion/article/1919092/dont-listen-ruling-elite-world-economy-real-trouble>)
- Yermack, D. , 2013. Is Bitcoin a Real Currency?. National Bureau of Economic Research Working Paper.
- Zizek, S. (2015). "Democracy and Capitalism Are Destined to Split Up". Big Think. Retrieved June 6, 2016 (youtu.be/AXVEnxtZe_w)