Taxation of Digital Assets

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I. Introduction

Digital financial assets are a fairly recent phenomena that thrives in the digital realm, mainly in the form of cryptocurrencies. By 2016, cryptocurrencies ceased to be a curiosity used by small groups of enthusiasts and gained considerable dimensions. The bitcoin network, the first and most popular cryptocurrency, for instance, holds a market capitalization value of around 12 billion dollars, comparable to the size of the GDP of a small country like Albania. Bitcoin's novelty brings about new properties and characteristics, creating some puzzles for which classical economic theory does not shed much light upon. Without information, policy makers have a hard time creating specific tax regulations or adapting existing tax codes to include businesses that surged around this "new economy".

This paper presents a short survey on how governments around the world are dealing with the taxation of bitcoin activity circa 2016. Bitcoin is used throughout this work as a proxy for all cryptocurrencies since, although more than a hundred of alternate cryptocurrencies are traded in markets around the world, they are largely variations of bitcoin (i.e. "forks" in the technical jargon), and most keep direct exchange rates exclusively to bitcoin in lieu of fiat currencies. Moreover, bitcoin has a much larger market capitalization and transaction volume than any of them, making it the most significant example among them by far.

This investigation develops as follows: section 2 presents a brief history of how bitcoin came to be; section 3 describes how bitcoin works from the perspective of the actors involved in its trade; section 4 discourses on the perspective from the point of view of governments and lawmakers; section 5 reports the various tax policies regarding bitcoin mining and trading around the worlds; section 6 describes the consequences of the concepts and policies adopted by governments, as described in the previous section; section 7 concludes.

II. A brief history of cryptocurrencies

Digital assets are, in essence, anything that exists in a binary format and comes with the right to use or, in other terms, anything that may be digitized in computers, and possibly transferred

over networks, for which someone may exercise the power of possession. However, unlike the "real world", something may have perfect, undistinguishable duplicates in the digital realm: a movie in someone's hard drive may be copied to someone else's, and there is no way to distinguish a priori the original from the copy. For a long time, this property posed a challenge for those that have tried to imagine a way of creating a system to simulate the functionalities of currency in the digital world: if I hold a dollar bill, no one else may have it unless I give it up, whereas if I have a digital file in my computer, I may give others perfect copies and still keep my original file at the same time. *Cryptocurrency* is a recent development that achieves this goal, it is defined by Wikipedia as a (decentralized) "medium of exchange using cryptography to secure the transactions and to control the creation of new units".

Bitcoin, on its turn, is the first cryptocurrency. Ron and Shamir (2013) define it as: "digital coins which are not issued by any government, bank or organization and rely on cryptographic protocols and a distributed network to mint, store and transfer." It was first described in a research paper entitled "Bitcoin: A Peer-to-Peer Electronic Cash System", published by a Satoshi Nakamoto on November 1st of 2008 in his site, bitcoin.org. The author himself announced its availability that same day in the *cypherpunk mailing list* (an Internet mailing list dedicated to cryptography).

It is generally accepted that *Satoshi Nakamoto* is a pseudonym, some believe it was most likely used by a small group of people rather than an individual. The mysterious inventor of bitcoin and blockchain remains anonymous to this date: he was skilled enough to use safe, encrypted messages to mailing lists, and crafted enough to write texts that disclosed no personal information about their author. Nakamoto has given up communications in the spring of 2011, after announcing he had "moved on to other things", and remains silent ever since.

In his paper, he describes bitcoin as a "system for electronic transactions without relying on trust". His invention achieves goals pursued by researchers for a long time: the creation of a digital currency technology which carries some of the properties of real world cash, most importantly that it would allow for anonymous and reliable transfers of assets from a subject to another. Up to that point, every financial transaction effected in the Internet depended upon trust of the participants over intermediaries (such as banks), which guarantee to both actors that assets would be retrieved from payers funds and deposited in sellers account. By design, there was no way to make an anonymous peer-to-peer financial transaction in the Internet until the appearance of bitcoin.

Eliminating the need of a trusted third party and allowing for secure anonymous electronic transactions had been goals of several projects since before the Internet went mainstream. Pioneers foresaw the boom of markets of digital assets which would follow its popularization, and considered this a necessary condition for the creation of those markets: people would need a way of securely purchasing products like digital music, books or movies over the network. At that time credit cards weren't considered a viable option specially due security concerns: much of a "classical" credit card transaction depends on transmitting sensible information over the wire, such as card details and cardholder's information (number, expiration date, cardholder name,

etc). In the mid–1990s, legacy card transaction systems were adapted to the Internet using secure communications (the HTTPS protocol), minimizing security problems. Although they didn't present all desired features, these systems have been considered good enough for applications and are used up to this date. The mechanisms within bitcoin (specifically, blockchains), on the other hand, do carry those features.

The first node came online on or about January 3rd, 2009, when Nakamoto minted the *genesis block*, the first batch of 50 bitcoins. On January 12th, 2009, Hal Finney was the recipient of 10 bitcoins in the first transaction. The first transaction for tangible goods was made on May 22nd, 2010: 10,000 bitcoins were transferred from Laszlo Hanyecz (who lived in Florida) to a person in London, who ordered a pizza from Papa John's and had it delivered to Hanyecz's house. The arrangement was made through an Internet forum populated by the first bitcoin enthusiasts. The 10,000 bitcoins were valued at US$41 at that time, by today's exchange rate that pizza cost over 7 million dollars.

III. Mining, transactions and exchanges

The main goal of bitcoin design is to enable secure monetary transactions over the Internet. Currently, bitcoins are used by people to buy a variety of goods and services throughout the network, and even in the "real world". Between retailers the accept bitcoins, one finds traditional companies such as Sears, Subway and Dell.

Bitcoin is, in essence, a digital ledger kept by a network of users. By saying that someone possesses one bitcoin, one is actually describing that there is an entry in the bitcoin ledger (i.e. an account) for which the current balance is one unit, and the possessor has the unique means of transferring any fraction of that unit to any other account in the ledger. The digital ledger keeps track of all the transactions of all the accounts since the inception of the network. Each transaction is digitally signed and guaranteed to be authentic, and may be promptly inspected by any one who withes to do so.

A priori, there are no registries to associate users to accounts in the bitcoin network, this facts yields the idea that bitcoin transactions are a tool for anonymous transactions. However, this is largely a misconception since every single transaction in the network is registered in the digital ledger and the digital ledger itself is widely public: anyone may download the ledger and inspect it at all times. Using some engineering, it is possible to track down bitcoin transactions to its owner, a fact proven by the FBI in 2014 during the infamous Silk Road case. Investigators were able to trace over three thousand transactions made in the timespan of one year by the owner of this illegal drug marketplace, and bring material proof to the court that the accused was indeed the person operating it. This notion was made stronger by a recent decision from a federal court in Northern California, granting the IRS the power to serve summons requesting information about the identities of any user of a major american bitcoin exchange between 2013 and 2015.

Every account in the digital ledger has a pair of keys associated to them: a public key, which uniquely identifies accounts for all users, and a private key, of exclusive knowledge of the legitimate account holder. Transactions are, thus, initiated by a paying user: having the intended

receiver account's public key, the payer uses special software and the private key for her account to digitally sign a transaction to the payee's account and broadcast it to the bitcoin network. Alternatively, service providers such as *Bitpay* allow merchants to receive bitcoins through special equipment attached to ordinary points of sales, and have them (fully or partially) converted to fiat currency on-the-fly for a small fee. These systems make bitcoin transactions similar to debit card operations. Payers and payees are known, in the bitcoin jargon, as *peers*.

Once peers broadcast their transactions, another class of users work to write them into the bitcoin ledger: *miners* perform a series of intensive mathematical operations to solve a cryptographic puzzle (called the *proof-of-work*), authenticate new blocks of transactions, and write them to the ledger. The process of creating a block is known as *minting*, and the process of continually minting new blocks is known as *mining*. Therefore, miners are continually involved in a race to mint new blocks and keep the bitcoin ledger updated. For this effort, they obtain an automatic reward (in bitcoins) from the network at each block they successfully mint. The mining algorithm was built to halve rewards at around every 4 years: at the inception, a miner would receive 50 bitcoins per minted block, since July of 2016, miners get 12.5 bitcoins per block. The system was designed to yield 21 million bitcoins until May 7th, 2140, when the last automatic reward for a block will be added to the ledger. From that point forward, miners will be rewarded per transaction. It is worthy noting that rewards are not transaction fees, for they are generated automatically by the system, and not payed by users for the services provided by miners, as fees would be.

When the bitcoin network was created, a regular desktop computer had enough processing power to mint a few blocks per day. As bitcoins became more popular, the competition for rewards escalated. Today, miners use impressive amounts of computer power to validate transactions, making it inviable for small mining operations to compete for new bitcoins. As a result, some users created associations in order to pool resources and enable ordinary users to participate in the mining activity. Circa 2016, there are around 21 mining operations spread around the world, between mining firms and mining pools.

At first, the bitcoin network kept on working as a curiosity among a community of internet enthusiasts, with no real value in the traditional economy. Bitcoins could only be acquired either directly from the network, through mining, or from individual-to-individual operation, through transactions arranged in internet chats and forums. The first exchange rate between bitcoin and the US dollar was established in October of 2009 through a web site called Net Liberty Standard. Using a calculation based on the cost of electricity needed to validate a transaction, they stablished a quote of 0.08 cents of dollar per bitcoin. On July 18th, 2010, the first bitcoin exchange was created: *Mt.Gox* was a website from a company based in Japan that allowed ordinary internet users to buy and sell bitcoins using the US Dollar. It worked like a traditional bank, holding bitcoins for users using its own accounts. It was the major cryptocurrency exchange until it went bankrupt 2014, allegedly by losing clients' bitcoins in a major hacking incident.

The complexities involved in individuals keeping their account's private keys safe created a secondary market for private exchanges, most of

them also provide services for keeping accounts in name of subscribers (digital wallets), turning them into a sort of banking system for the bitcoin network. As of December 2016, there are 63 active private exchanges listed in 26 countries around the world. Each exchange keeps its own independent price for their users to buy or sell bitcoins into national currencies. However, no government in the world currently keeps official exchange rates from bitcoins to national currencies: bitcoins are not recognized as a valid foreign currency anywhere in the world, and there is an ongoing debate whether it should be indeed defined as currency or asset (e.g. Blundell-Wignall, 2014). This discussion ultimately brings about the various ways taxes are levied over bitcoin activity all around the world, as we discuss in the next sections.

IV. The nature of bitcoin

Due to its novel nature, there is no unanimous agreement on how Governments should think of bitcoins.

Bitcoin ultimately performs the three functions given to money by Hayek (1976): it is a medium of exchange, for individuals are able to trade goods for bitcoins and vice-versa; it is a unit of account, for the price of any good may be expressed in bitcoin units; and it is a store of value, for a user may keep bitcoins under her private possession and be able to smooth her consumption using it in the future. Therefore, the concept that bitcoins are currency by nature is straight forward when one considers its use as described in its original design. However, critics point out that, regardless, bitcoin is not money mainly because it exists only in the virtual realm, it is not government issued, and it has no intrinsic value.

The lack of government issuance is a hard obstacle to overcome for bitcoin to be accepted officially by any government in the world. The main issue is that all currencies in the world are monitored by the IMF (except for North Korea, the only non-member). The IMF pools resources in currencies of each member country in order to be able to help Central Banks to fight a speculative attack on their currency. However, the agreements that constituted the IMF after the second world war don't have any provisions to allow it to build reserves of a nonmember's currency, therefore, the IMF can't build funds using bitcoins. The resulting lack of power to intervene in bitcoin exchange rates relative to any currency generates fears that bitcoin may be used in speculative attacks, and the IMF would have its hands tied to help the attacked country. The various agreements involved in participating in the IMF makes it hard for any country to accept it as official since it cannot be accepted as such by the IMF. Plassaras (2013) proposes amendments to the IMF regulations in order to accommodate the existence of bitcoin funds, such as granting it the status of *quasi-currency*. Developments on this issue are yet to be seen.

Nevertheless, Mccollum (2015) rejects all argument against the concept of bitcoin as currency: that until the mid–20th century, currencies were supported by the value of gold, and not by trust in government issuance, therefore lack of government backing may not be considered impediment to recognizing the status of bitcoin as fiat currency; that most of the world is moving towards a fully digital financial system, therefore all currency will ultimately be intangible and no different from bitcoin; that intrinsic value is a

product of both scarcity and public confidence, and bitcoin has both. Moreover, the author debates some technical arguments that are used against the recognition (and even the use) of bitcoin, although they do not directly attack this concept: that it lacks regulation, it is not secure, and its volatile exchange rate makes it impossible for it to be adopted officially. He points out that the lack regulation is a cyclical argument (it is not regulated because it is not accepted, and vice-versa), therefore invalid; that security is just as good as the holder makes it, hence bitcoin is intrinsically no more insecure than paper money; and that volatility of exchange rates is not exclusive to bitcoin, since currencies like the Swiss franc or the Russian ruble have suffered swings in exchange rates as large as 40% against the dollar in a matter of minutes during the past few years.

Particularly, treatment of the concept of bitcoin in the US has been highly controversial. In 2013, in a law suit moved by the US Securities and Exchange Commission (SEC) against a bitcoin-based Ponzi scheme, a judge in Texas ruled that bitcoin is a form of money, which only limitation is where it is accepted: "It is clear that Bitcoin can be used as money. It can be used to purchase goods or services, and as Shavers stated, used to pay for individual living expenses. The only limitation of Bitcoin is that it is limited to those places that accept it as currency. However, it can also be exchanged for conventional currencies, such as the U.S. dollar, Euro, Yen, and Yuan. Therefore, Bitcoin is a currency or form of money, and investors wishing to invest in BTCST provided an investment of money." Nevertheless, in July of 2016, a Miami-Dade circuit judge ruled that it is not, because it is not "backed by anything" and is "certainly not tangible wealth and cannot be hidden under a mattress like cash and gold bars." Charges in this case were dismissed by the judge on the basis that "This Court is not an expert in economics, however, it is very clear, even to someone with limited knowledge in the area, that Bitcoin has a long way to go before it the equivalent of money."

In spite of that, later this same year (November 2016), a Federal Judge from Manhattan reverted the status of bitcoin to money once again. In the latter decision, bitcoin is found to be "funds", in the sense they are "pecuniary resources… generally accepted as a medium of exchange or a means of payment". Although the US law does not strictly define "money", it defines "funds", and it is generally accepted that these two concepts are equivalent. It is worth noting that, for the bitcoin concept as currency to ever to be unambiguous in the US, it is necessary that it be made so by the federal sphere, since article I of section 10 of the US Constitution constitution imposes an obstacle for individual states to recognize bitcoin as legal tender.

Denying the currency nature of bitcoin is the most widely position adopted among governments around the world. According to a recent survey from the US Library of Congress, only a few governments adopt a view that, although it has no legal tender, it is money in the sense of "private money": "as a currency provided by private enterprise aimed at combatting government monopolies on the supply of money". This is roughly the equivalent to defining it merely as a method of payment, such as debit cards. Such countries include Germany, Canada and Singapore, although, albeit using a similar concept, each has developed different views on how it should be treated for tax purposes.

In the end, the wild variation in bitcoin exchange rates naturally gives rise to the idea that is is in reality a financial asset, a commodity or a property, used primarily for investment purposes, and the existing tax code used for such assets is suitable. This alternative view is currently adopted by some governments in the world, making it the foundation for their tax regulations regarding bitcoin. In 2014, the Brazilian government created laws for taxation of digital assets using this view, giving power for the Central Bank of Brazil to create further regulations on this subject. Later that same year, the US Internal Revenue Service published a notice informing taxpayers that bitcoins are property for tax purposes even though it could be interpreted as money by using the definitions in the tax code.

Using this concept, one should think bitcoin transaction as barter exchanges: bitcoins are goods traded for other goods. Unfortunately, this barter concept can't also perfectly define these transactions. For instance, barter clubs, as defined by the US regulations, use credit units to enable transactions to account for goods or services provided by the club. However, the provisions for barter clubs take in consideration they are closed systems, all transactions happen in the domain of the club and its members, whereas bitcoin is an open system: once an individual acquires bitcoins, she has the freedom of spending them as fiat currency with any merchant that will accept them as payment. Moreover, bitcoin exchange rates are subject to market forces while barter clubs have strict control over the price of its credits; and bitcoins are issued by users through the means of mining, while barter clubs have exclusive power of issuance over its credits. In any case the commodity notion is ultimately very close to that of private money as previously mentioned: a commodity that may be used for barter and exchange. Most governments take a hybrid view in this issue, ignoring the barter concept in the described strict form, and consider bitcoin transactions as a monetary exchange in nature (with exception to Australia, as we see later on).

Therefore, wether bitcoin is a money or a commodity is an ongoing discussion, the exact concept is yet to be determined by countries all around the world. Meanwhile, regulators try their best in creating laws to enable taxation of the economic activity surrounding the bitcoin system by arbitrarily choosing one concept or the other, yielding distinct economic consequences in each case, as we see in the forthcoming sections.

V. Bitcoin and tax regulations

Since governments can't agree on a unique basic concept for bitcoin, tax treatment varies wildly in the world.

In the US, bitcoin tax is levied with income taxes, either subject to capital gains and losses tax (when it is traded), or as regular income (for miners). Taxpayers have to report bitcoin transactions by converting the value spent at the date of transaction. Thus, when using bitcoins for trading goods and services, taxpayers have to account for every transaction. For being property subject to capital and gains taxes, bitcoins are reported only at the time of realization. For instance, purchasing a $2 cup of coffee with bitcoins bought for $1 would trigger $1 in capital gains for the coffee drinker and $2 of gross income for the coffee shop. Bitcoin exchanges compute gains and losses with exchange rates. Miners simply compute the US dollar value of bit-

coins of their rewards as regular income, and get to deduct expenses they incurred in mining (for the most part, the cost of energy spent in activity plus hardware acquired for this purpose). When spending their rewards, however, they must compute gains due to exchange rates from the day they were received up to the day of spending, just like traders and ordinary users. In Brazil, bitcoin transactions are subject to 15% financial transactions tax once their value converted to local currency exceed a certain threshold. This is basically the same mechanism as in the US, the difference begin that the new law about digital currencies introduced in 2014 provides clear guidelines and definitions and gives power to the Central Bank to issue further regulations regarding the subject.

European countries, on their turn, use a simplified mechanism for taxation: in the United Kingdom, bitcoins are generally treated as foreign currency for tax purposes; in the European Union, a recent judicial decision determines bitcoin transactions are exempt from VAT for they are considered means of payment, giving it practically the same status as in the UK. Thus, when buying the aforementioned cup of coffee, transactors simply compute the VAT for the Euro value of that cup. In both cases, bitcoin mining activity is seen as falling within the definition of "'transactions, including negotiation, concerning deposit and current accounts, payments, transfers, debts, cheques and other negotiable instruments", thereof no VAT is due. However, all businesses do have to accrue gains with exchange rates, and pay taxes using the same rules that regulate foreign currency exchanges. This liberal take on the bitcoin economic activity is praised by entrepreneurs as a boost for the Fintech sector. However, some countries are recently seeking to create taxes targeted exclusively at the bitcoin mining activity: Spain, for instance, is said to be planning to create new regulations that apply rates as high as 47% to the profits of mining activity, allegedly in order to curb money laundering, tax evasion and cybercriminal activities. Bitcoin miners in Europe should also be affected by the proposal of levying taxes over financial transactions, created to "make the financial sector pay its fair share", justified by the significant financial help they received during the financial crisis of 2008.

Australia is another notable case: until 2014, bitcoin trade was exempt from taxation in Australia but, in August of that year, the Australian Taxation Office introduced a regulation ruling that bitcoin transactions are similar to barter transactions, thereof subject to the 10% Goods and Services tax. According to that country's regulations, both parties should pay taxes over the goods involved in barter transactions, hence double taxation occurs when bitcoins are used to purchase goods or services in Australia: both payer and receiver end up paying GSS tax over the nominal price of bitcoins in a transaction. Bitcoin companies from Australia accused their government of turning Australian bitcoin-related businesses unviable with this new regulation. In March 2016, the Australian Government has introduced a policy statement entitled "Australia's Fintech Policy", in which it declares its intention of encouraging the cryptocurrency industry in that country. In the document, by stating that "the Government recognizes that this treatment may be preventing the use of digital currencies and hindering their further development", the Australian government admits it made a mistake by creating double taxation, and it is thought to soon change the rules in order to revert it. The

general opinion is that it will move in the same direction of European countries, using the concept of bitcoin as a foreign currency.

Some other countries, however, consider bitcoin to be an instrument for black markets and spurious transactions, and currently work in the direction of making it illegal under their law. China issued a notice in 2013 saying that bitcoin is not a currency and that it should not be circulated and used in the market as currency. Banks and payment institutions have since been prohibited of dealing in bitcoins in any fashion by new regulations. However, it is not considered a crime for Chinese nationals and non-financial related institutions to deal with them: some of the world's largest bitcoin miners operate in China, and large businesses, like WeChat, accept bitcoins as payment methods for goods and services. Iceland goes a step further and considers a crime any dealings with bitcoins, for it may violate the Icelandic Foreign Exchange Act, which specifies that Icelandic currency cannot leave the country. This regulation was created in response to the Icelandic monetary crisis of 2008, in order to prevent further shocks on the local currency exchange rate by issuing severe control over the possession of foreign currency by Icelandic nationals. The bitcoin mining business, however, is tolerated in Iceland, with no current taxation or restrictions. Russia goes even further than the former examples, proposing legal action against any dealing with cryptocurrencies. In 2014, its Central Bank declared that bitcoin transactions are a "dubious activity" associated with money laundering and terrorism financing, and recommend nationals to refrain of using it. Later that same year, the Ministry of finance proposed a new regulation that recognize these actions as misdemeanors and imposes fines for dealings.

VI. Taxation issues

By adopting the commodity view or the foreign currency view, government decisions affect both taxpayers and technology adoption in different ways.

The current IRS rules that define bitcoin as property are defended by McLeod (2013). In his reasonings, bitcoin is better defined as a financial instrument, more specifically as a commodity. A commodity is legally defined as "a movable and tangible thing that is ordinarily produced or used as the subject of barter or sale". He argues that, although bitcoin is not a "real thing", it fits the definition because one may exercise constructive possession over it ("dominion over the premises in which the item is concealed"), and courts have already accepted that it applies for other virtual goods in the past. He also points out the similarities bitcoin keeps with gold, a recognized commodity: its value is directly connected to people's desire for it; the supply is limited; and it is obtained by mining. The IRS point of view is that regular users buy and sell bitcoins in short periods, and they should not see any additional burden due to the regulation. Conversely, it claims to aim mainly to tax profits made by those who hold bitcoin as an investment.

In an opposing view, McCullum (2015) argues in a series of proposals for bitcoin regulation in California that, by taxing it as property, the US government ultimately hinders the growth of bitcoin as means of payment. He disagrees with the current point of view adopted by the IRS, mainly in the conviction that it is not feasible to distinguish regular users who hold bitcoins in wallets as a noncapital asset and actual investors and, therefore, tax payers will be subject to ar-

bitrary interpretations by the IRS of their intentions when holding bitcoins. Moreover, according to his arguments, the cost of record keeping is too much of a burden for both taxpayer and tax authorities, and losses with swings in exchange rates may be aggravated by the *wash rule*. Together, these facts create disincentives for people to hold bitcoin and use it in day-to-day transactions.

As for record keeping, according to the current regulation, taxpayers have to keep detailed records of each and every transaction in order to report them. Aside from the obvious cost of keeping records, there are several issues that may affect both taxpayers and the IRS: for instance, how should one decide which bitcoin spent is relative to which bitcoin bought inasmuch as the user balance is consolidate in a single account? One may use one of several legally accepted artifices to determine the tax base, such as "first-in-first-out" or "last-in-last-out", making it hard for the IRS to track down the exact amount due. It is also unfeasible for the IRS to track down each and every part and counter-part of each transaction, therefore two participants of a transaction may declare very different conversion values for tax base and it is very difficult for any of them or even the IRS to check consistency, subjecting taxpayers to unwarranted audits, and the IRS to high costs of verification.

The wash rule, on its turn, dictates that purchase of similar property within a 30-day window serves to eliminate the recognition of capital losses on a transaction, avoiding stock investors to create artificial losses via churning. But, by using bitcoins in regular payments, a user is expected to continually make new transactions with them, in both directions: acquiring new bitcoins and spending them for goods and services. Thus, in the bitcoin context, applying the wash rule with this frequency of transactions would most likely turn users unable to write off any losses occurred in exchange rate swings, for there would always be a significantly similar buying transaction within the wash rule window to invalidate those losses. Although section 1901 of the tax code, which describes the wash rule, applies only to "shares of stocks or securities", the uncertainty regarding the nature of bitcoins and the freedom given by the current regulation for the IRS to determine taxation over bitcoin assets case-by-case makes it feasible for the agency to invoke the wash rule at any moment, creating uncertainty.

Following this criticism, McCullum argues that bitcoin is better dealt with by having the status of foreign currency, the same view adopted by European countries. By adopting this tax treatment, the US government would be able to improve bitcoin acceptance among merchants and consumers, and push out investors from the market. Foreign currency is taxed as ordinary income gain or loss by translating its value into US dollars at the time the taxpayer reports her income, and capital treatment may be elected in specific instances. Because the majority of transactions would result in ordinary income treatment, it would neutralize advantageous long-term tax positions for investors, and they would tend to leave the market. At the same time, it would simplify the use of bitcoin for taxpayers, by eliminating the need of costly record keeping. In any case, a review for the current rules in the US seem to be on its way: the US Treasury Inspector General for Tax Administration (TIGTA) has released a report in November of 2016 detailing an extensive audit of the IRS strategy regarding bitcoin taxation,

and concluded that the current rules are insufficiently clear for taxpayers and that they generally discourage compliance, empowering McCullum's arguments.

In the end, current bitcoin tax regulations are largely based on the perception of governments regarding the Fintech sector and the bitcoin network, which may be summarized as one of two: either the tax authority sees bitcoin as a speculative market and a vector for monetary transfer with no government oversight; or it looks at bitcoin as merely a new technology that enables monetary transfers, similar to the existing debit or credit card networks. The former point of view is enforced by the swift valuation of the value of bitcoins once the public became aware of it, and by the collateral extraordinary profits the first investors were able to earn with it. Government intervention is indeed necessary in this case, mostly to equalize these new enterprises with the classical financial sector, but also to provide some oversight in order to avoid spurious activities. However, this moment in time seems to be a transitory state: as argued by McCullum, there is a feedback in which the current uncertain state of affairs makes the bitcoin-related economy more volatile, and volatility making affairs more uncertain. With time, as technology and enterprises mature and regulations are consolidated, one should expect exchange rates to stabilize and wipe away the advantage of holding bitcoins as investment.

Hence, the perception of bitcoin as a commodity as basis of tax regulations is expected to cease to be applicable in the future, and may be considered a short-term solution: quasi-emergency measures created to deal with novel, poorly understood technology. The concept of bitcoin as foreign currency seems to generally avoid some of the drawbacks of the commodity concept, and it may be adopted by the majority of governments in time.

VII. Conclusion

For being a fairly recently introduced technology, bitcoin and cryptocurrencies are phenomena yet to be fully understood by regulators. In the lack of suitable methods to deal with the devices of this economic ecosystem, tax authorities around the world opted for interpreting them as new instances of old financial instruments in order to be able to apply the existing tag regulations. However, the new assets don't perfectly match old definitions, bringing about several obstacles. In a first look, the main problem seems to be the lack of government backing, one of the characteristics cryptocurrency enthusiasts praise the most. It creates both the conundrum of making official recognition as foreign currency unfeasible and the sheer impossibility of prohibiting citizens to use it.

As for the regulations themselves, we analyzed the two solutions governments found: either to consider bitcoin as a property, which solves the problem of taxing the mining activity, since it is straight forward a profitable activity that yields taxable income, but creates problems when dealing with transactions and exchanges; or to alternatively grant it the status of foreign currency, which works well with transactions and exchanges, but falls short on taxing mining activity due to considering rewards similar to financial transaction fees, whereas it is essentially not so. While both concepts may be adequate for the time being, the commodity concept is thought to hinder technological advance, since it

makes it difficult for governments to tell apart the usage of bitcoins as means of payment and its usage as investment asset, creating an unnecessary burden for users who wish to use it in day-to-day transactions, essentially its main function.

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