Cryptocurrencies: the communication inside blockchain technology and the cross-border tax law

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Abstract: This research aims to analyse the social event that is modifying the traditional financial system since the blockchain technology and cryptocurrencies came up. Taxation in international scenario were examined by the ideal from governments in a democratic system as an instrument that materialises human rights. The social observation approaches the legacy of Emile Durkheim philosophy who established a power relationship between social fact and coercion. Taxation has been the focal point in smart economy to juridical scientists and everyone involved in the digital economy. This research conducted tests and researches from historical and social method, seeking for laws, doctrine, jurisprudence and concrete case analysis in front of the

philosophical school of logical-semantic constructivism as a suitable means to verify the possibility of constructing a matrix rule of tax incidence. This research was enough to show that the blockchain technology and cryptocurrencies fulfils its humanitarian role in the smart economy.

Keywords: artificial intelligence; AI; blockchain; cryptocurrency; domain name system; DNS; human rights; ICANN; international tax; logical-semantic constructivism; matrix rule; peer to peer; smart economy; United Nations; UN.

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1 Introduction

The society has been evolving and seeking ways to become increasingly globalised in all aspects of life in society. The latest phenomenon is in the field of technology and it was inserted in the economy through blockchain and cryptocurrency where we have the Bitcoin as the best known among them all. People in the world do not see the simple social network as a means of communication as they were doing in the past. Indeed, they are creating a global financial network through communication exchanging data without government interference or banks.

The smart economy was introduced in international community by disruptive theory. After two years in researching, the authors established the juridical concept about this theory. *Disruptive theory is a process of social and business survival while introducing a foreign element to the industry. This element will modify the industrial behaviour as a whole: production processes, marketing, supply chain, demand policies, compliance,*

laws, social and governmental behaviour. It is not a procedure driven only by competitive techniques, but it is a procedure that reverses the order of power in industry or just about one sector through technological practices. There is a balance between supply and demand. In fact it is a 'leverage process' that adds social value.

This recent social fact was driven by the existing power relations within society. The democratic system of government provides freedom for citizens to measure and define government interference in the private life them. So, they would not submitting to rules from banks or governments. They are yearning get more dignity through a new system with complete freedom provides by blockchain, a database shared and distributed over a *peer to peer* network through the *domain name system* (*DNS*).

Noting carefully that the rule should be minimum to guarantee security and legality to the individuals under penalty of it is deforming the concept and function of cryptocurrencies.

It is so clear that countries will get several and solid benefits from technologies applying artificial intelligence (AI), internet of things (IoT) and blockchain to smart economy within the political and socioeconomic scenario that is rising the humanity to *6ª generation of human rights:* it means the social and technological rights to development themselves as a fundamental value that the individual has for self-management, self-development and self-concept.

The taxes are a node requiring political wills to solve and impacting in investments to bring a security environment to smart economy. The authors present some solutions to the regulatory framework and justifications for legally defence of *blockchain for goods*.

The authors show how the semantics is an important aspect about linguistic to building and interpreting the law when the need arises to make the regulatory framework for new social events as in the case of disruptive theory.

2 The social fact and the constructive process

For many centuries, the coins that were references to each country did not generate discussions about legality or doubts to insert the way to taxation. There were different names to refer a commodity, generally gold or silver, applied monetarily. This universalism over the money was useful to all countries because it promoted free trade, it was aiding merchants in economic calculation, and represented a solid and reliable means of concentrating power with rulers.

By the way, the governments used the practice of depreciating money to maintain and increase state power because it was a faster and less critical means than the traditional method of taxing the population to give power to the public coffers.

It is perhaps ironic way at the states used this method of power and coercion over money to leverage the economy increasing the living expenses that it was being financed by the slow and gradual impoverishment of the population.

Since the World War I, the method adopted was the issuing paper money to make revenue and finance the costs of war led the world into widespread bankruptcy. After the 1970s and till 2008, currency reform plans spread throughout the world in forums and discussion groups aimed at strengthening the world economy and reducing poverty. However, governments were not interested in this discussion that threatened the monopoly of power.

But in 2008, Satoshi Nakamoto, called as '*cyberpunk*', took the incredible initiative of reinventing the currency in the form of computer code. The result introduced Bitcoin to the world. Nakamoto released it with a white paper in an open forum saying simply: "Here is a new currency and a payment system. You can use it if you want."

Bitcoin was absolutely non-reproducible and constructed in such a way that its historical record of transactions made it possible for each monetary unit to be reconciled and verified in the course of currency evolution.

The currency was owned by no one in particular and resided on an open source network, thereby it was removing the problem of a single point of failure. Encryption, a distributed network, and a continuous development that is made possible through developers paid for by the transaction verification services provided by them and that they were entered into the system. Those combined attributes created and reinvented money in an interesting system to users and without interference from governments or banks. This meant pure materialisation of a *noble democratic principle: power in the hands of the people*.

Actually it is an emerging international currency created by market forces with a foundation in entrepreneurship, market exchange (barter), and democratic principles. By the way, to ensure the focus about our main subject studied here, the authors did not bring the public and uncontested data table on the quantitative evolution of the currency.

After study, the authors realised that the social fact as the trigger event of this new currency and it is being drawing by the *Functionalist theory and Collective Consciousness of Social* fact as studied by Emile Durkheim (1858–1917), where is possible to know the society is drawn by the role that the individual develops in the group and the forces that weighs on him will makes react in self-defence (Reale, 1998).

Durkheim's studies led him to states three attributes for the social fact: generality, exteriority, and *coercivity*. The *generality* refers to the collective social facts that affect the whole society (collective). The exteriority means the characteristic of the social facts existing when the person births and this is external to this person who has not the mastery of choice over them and must react as they are presented. *Coercitivity* is related to the power or the force that the patterns of culture are imposed on the members of a respective society. This characteristic push the individuals to meet cultural standards.

In this way, the collective consciousness comes with the socialisation of the individual provided by the environment and culture that this person is inserted.

To the authors, the emergence of cryptocurrency comes as a response to the pressure that the individual has been suffering since the end of World War I that it was responsible for global impoverishment to generate security and enrichment for the governments and banks. About banks, they were enriching themselves taking advantage from people that was needing financial assistance.

It was being drawed a situation of high state interference in the individual private life and that is incompatible with the democratic system and collective consciousness.

The return to the teachings of the social fact as Durkheim thought us is important now because it represents a logical way for the new message created by *blockchain* technology and the *cryptocurrencies* to reach interested parties and be part of positive law as a tax legal fact. The technique to interpret this fact goes through the semantic logical constructivism theory.

The juridical study is starting from the point the right language will be built through the facts that arise and from which are extracted the necessary signs to construct the message through *signification*.

In respect to all philosophical schools that aim to conceptualise the *Law Science* and validate norms, these theories do not explain the new socioeconomic event because, one, is not exhausted in the concept of natural law, two, lacking subsidies to ground that just the justice and validity of the norms would be coincident. For our study, these isolated concepts will not be useful as a premise to validate the financial system in the context of *blockchain* technology and virtual currencies.

After this considerations, there is only possibility of transcribing this event to a competent legal language aims to validate and support legality the institution of taxes through the philosophy contained in the theory of *semantic logical constructivism*. This technical allowing the possibility of dialogues with other methods and it will not committing the sin of to study the object in isolation without the methodological cut necessary and appropriate to reality.

Talking about philosophy of language, to make right and logical conclusion to claims if it will be possible to increase the activity inside *blockchain* with taxes, also the authors will consider the *linguistic turn* knowing it is not ground on absolute truth and it will be a human responsibility to do the interpretation to builds the sense. The act of interpreting is based on language and will create reality through associations starting from a referential point such as: time, place, space, culture of the cognoscent subject, based on a model. The *logical – semantic constructivism* is an instrument that adjusts the form and substance from thought join the means and process to construct the legal text in view that language is always part of legal science.

It brings logical schemas to our thoughts materialising the language with a small degree of certainty by combining the syntax of the words and the content throughout choices most appropriate to the event that presents itself. These *signs of communication are studied by semiotics* and they are on the side of logic. The next step is to add the semantic load to find to know the truth about the event (Carvalho et al., 2014).

In this way, the *cryptocurrency* event represents the communication between the citizen of a specific country, the government and the rules with some degree of coercitivity referring to the traditional financial system when compared to the new innovator system in the field of virtual communication technology.

At this point, the authors ask the reader's attention to the semantic about the term 'virtual'. When it says that the currency is virtual it does not means 'unreal' coin. The *Bitcoin* currency and other correlates are a real coin, virtual is the technology employed to bring them to reality.

Law Science as a way to communications has the responsibility to build meaning and understanding of the text to draw the reflexes that the *blockchain* brings to society, governments and International Tax Law. This way the Law Science will be able to tell a new reality. Including, the currency in question is cross- border and only deals with 'legal compliance for each countryrespectively'. These are the only rules that the new chain of wealth, jobs and taxes needs to deal.

The referential model as a determining factor that is accepting the truth as relative and it does not means denying the true propositions, because the truth is relative and not absolute since the interpreter will seek to attribute meaning to the fact by creating propositions.

Bringing it for us, I am going to build the *matrix rule of tax incidence* (*RMIT*) if it is possible. But to come there, I realise there is a necessity to know about this possibility I will accept the true about the scenery in blockchain and *cryptocurrencies* being the social event as a relativity to build propositions. In the end, we can to know if governments will be able to establishes taxes and rules.

So, if this is the premise adopted here in this study, we cannot deny the impact that the new reality in *blockchain's* technology brought us since society responded to what existed in the traditional oppressive financial system with determination and effectiveness. The marks of this social reaction are bringing social and economic impacts. Behold, popular reactivity cannot be neglected since it has added relevant technological development.

That said, the governing authorities have no other way otherwise it to create a minimum protective rule appropriate to the function that the virtual currencies are playing.

It continuous the development, the authors is clarifying that event and *fact* are not the same thing.

Event is the presupposition for fact, that is, the event is the occurrence in the fact's world that has not been converted into a linguistic account. In the other hand, *fact* is the event supposedly happened and concerns the denotative statement about a situation considered in time and space. This will always be referred to the past. The fact becomes legal when pronounced through legal speech.

Forward, the *RMIT* refers to the tax law in the strict sense, since its core is essentially the definition of a general and abstract legal standard capable of identifying the minimum elements of the tax standard. It is *hypothetical-conditional* judgment that embody a *hypothesis* and a consequence.

In the development of *RMIT* we establish elements to determine the antecedent and the consequent. The *antecedent* is determined by three criteria: *material*, *spatial* and *temporal*. The *consequent* shows us two criteria: personnel and quantitative and it is determined by the *calculation base or assessment basis and aliquots*.

In summary, the RMIT hypothesis pick up an event forecast, and when this is concretised, the interpreter will describe in technical legal language establishing the obligatory link between the *taxpayer* (taxable person/duty to perform the tax liability) and the state (active subject/will receive *the tax liability*).

There is a legislative vacuum for the economic and financial system of investments in the blockchain field and the use of virtual currencies. We note that this gap exists throughout the world.

After these considerations, it is not possible to deny the tax effects and the need to bring a minimum rule for this field. There is no compassion for *ratched effect* because the social retrocession is impossible to admit it within the context of *legal certainty*.

In addition, prohibiting the *ratched effect* is already a recurring practice in Brazil's legal routine and it is a practice defended by the Brazilian Supreme Federal Court (*STF*) by Minister Luis Roberto Barroso. Although, it is implicit and fruit of doctrinal creation, the principle of in the *social setback* is the necessary consequence from superior *principle of legal certainty*.

This constitutes the bond to the protection and progress of fundamental human rights that legitimise constitutional guarantees to taxpayers. The predictability in intersubjective and of taxpayer relations with the treasury prevents regression.

Establishing standards in this field means making rules with minimum interferencing in their operating environment under risk of mischaracterising the function and purpose of the virtual currencies. We must remember that this coins have got her origin in the absence of state control and they occur outside the banking institutions. Also they use only the electronic communication of technology in *peer-to-peer* chains by addressing the *DNS* and *ICANN* that is a controller to registrars.

About the international economic scenario, some countries do not interpret properly the signals from a new economy. For a example about the lack in regulatory framework, Brazil, the Federal Revenue Service has being treated the virtual currency as a financial asset. This way, the taxpayer must declare spontaneously and they will get under a incidence of income tax if there is a capital increase resulting from in disposal of assets. In the other hand, OECD condemn the double taxation and to the authors, there is a double tax impact in the same tax source when governs considers the trades in smart economy through cryptocurrencies like a income assets.

However, in the international scenario this assumes diverse features and we will return to this point in due course. The *Bitcoin* and *blockchain* are already a reality and evolve every day demanding a behaviour typical from legal professionals, governments and economists. The new social and economic reality required the quest to interpret reality, observing the events and their signs and applying the accumulated knowledge.

3 Interactions between blockchain, Bitcoin, DNS and smart economy

The information contained in this research will be get it incomplete or inadequate understanding if the relationships between *blockchain*, *Bitcoin*, *DNS* and *smart economy* are not drawn and this is the opportune moment to bring this to the text.

Nowadays, the *Bitcoin* means the emerging international currency, created entirely by market forces. It must be argued that against *market forces* governments can influence nothing in order to restrain, modify or appropriate.

The financial system is being reinvented against of willingness from bankers and this did not come about because of international conferences or because an academical group joined to formulated a plan. But this social event, subject of our research, is justified because science and technology reactively join *cyberpunks* in the name of a worldwide need: to acquire greater financial privacy, access to wealth, access to jobs, financial freedom and power conducting globalised business without the interference of payment intermediaries, less fees and costs in payment transactions.

According Tucker and Ulrich (2014), a Austrian lawyer, currency expert Bitcoin, is speaking it:

> "Blockchain's financial system runs from the outside in and from the bottom up, based on the principles of entrepreneurship and market exchanges. It is truly incredible how much this whole process happening before our eyes conforms to the model outlined by Carl Menger's theory of the origin of money. There is only one difference which has surprised the world: the basis of Bitcoin's value lies not in its prior use in barter, as Menger has described, but in its current use as a payment system. How privileged we are to witness this event in our time!"

At this point the authors disagree partially with the text above text. For them, what happens inside *blockchain* is genuine data exchange that results in financial value only at the end.

From these premises, it is possible to affirm that the *blockchain* technology allied to Bitcoin is system that will face problems typical of innovation. However, it is a potential that will ascend into the future and it does not back down.

Bitcoin has inherited all the best characteristics existing in the best money: it is scarce, divisible, high portability, incorporeal, without intermediaries, solid, it is not under the power of government's intervention and it is universal. These are characteristics that facilitate the transfer of ownership at zero operating cost. Transaction rates are practically zero. In addition, there is security, fraud protection, speed, privacy and more that make *Bitcoin* a superior technology that is requiring investments in this field.

This new financial system with *Bitcoin* is not perfect now and there is high risks. But it is requiring just a few adjusts. So, some rules or governments standards will fix it and become it in a better option as a financial system. In this way, it will manage the situation aggressively around whole banking system that suffers the interference by the power of governmental intervention that does not always move to meet the public interest.

It is worth mentioning, however, that governments are not happy with this currency, but they are powerless against market forces. However, there is a loophole that allows rulers authorities to establish tax through the currency conversion operation, this will be possible when it is exchanged for another traditional currency that circulates with the intermediation of a financial institution.

The concept about Bitcoin is well drawn by Ulrich (2014):

> "Very briefly, Bitcoin is a kind of money, just like the real, the dollar or the euro, with the difference that it being totally digital and isn't being issued by any government. Its value is determined freely by the individuals in the market. For online transactions, it is the ideal form of payment as it is fast, cheap and secure [...]. With Bitcoin you can transfer funds from A to B anywhere in the world without ever having to rely on a third party for this simple task. It's a really innovative technology [...]. Bitcoin is a digital currency peer-to-peer, open source, which it doesn't depend on a central authority. Among many other things, what makes Bitcoin unique is that it is the first fully decentralized global payment system. Although at first glance it may seem complicated, the fundamental concepts are not difficult to understand [...]. Bitcoin is software, therefore, it is materially inexistent. A monetary unit of Bitcoin is simply an electronic accounting note where the current account (the Bitcoin address or the public key) and the balance of Bitcoins at a given time are recorded. In this sense, a unit of Bitcoin doesn't differ in anything from a unit of real or dollar deposited in a bank, since it is also a mere electronic accounting record. But there is a big difference; in the case of Bitcoin, the space in which the records are concluded is unique, universal and shared by all users (the blockchain), while in the current system each bank owns and controls its transaction log (its own ledger)."

Without forgetting that legal construction requires a certain degree of pragmatism, practical results and in line with reality, corroborate asserting without fear of error, *blockchain's* technology emerged to give security to transactions with *Bitcoin* fixing the problem of 'double spending' by preventing duplicate payments and solving an old problem.

Combining the result from my researches with the great and invaluable technical contribution brought by the expert Ulrich about this technology, I will describe its functioning and interactions.

When we think about *blockchain* technology we realise that this means the genesis block that when encoded in the software serves as the starting point of the system loading information about the rules or instructions about the remaining database.

In a subsequent step, the database is formed from a series of blocks which together form a chain. This is where the name 'block chain' or public transaction record (*blockchain*) comes up. Each block in the chain contains information or transactions. This is the system that solves the problem of '*double spending*' and without the need for intervention by a third party. Bitcoin does this by distributing the historical record to all users of the system via a *peer-to-peer* network, or I can simply say: delivery of the data (message) to the recipient in paired register.

All transactions concluded in the Bitcoin economy are recorded in a kind of public ledger and distributed in blocks called blockchain. The ledger is the mains grouping of accounting records of a company that uses the double-entry bookkeeping method or standard records system. As you add transactions, your information is stored in the block according to when it was processed.

After the transactions are piled in the block, a *hash* is added at the end of the block. The hash is connected to the previous block of the chain. These hashes form the bonds returning between the chains until they reach the *genesis block*. The *hash* includes the current block number and the next block number in the chain. It also includes the date and time that was signed in addition to the amount of transactions included in the present block. The hash appears as an encrypted key and can not be modified and it is impossible to recreate the input value. Encryption is algorithms that carry encryption for those who have the access key.

The computational force performs the records and the reconciliations of the transactions under the responsibility of the users (Mineradores). These miners are rewarded for their work with newly created *Bitcoins*. The *Bitcoins* are created, or '*mined*', as thousands of scattered computers solve complex mathematical problems that verify transactions in blockchain.

In addition to everything else, this system brings new professional positions that it is not placed in a knew list because they were nonexistent until blockchain entered the world economy.

How is currency created in the virtual world to be used in the real world?

The answer is: science and technology. What happens in the case of *Bitcoin* is a search through computers to find the correct data sequence (the 'block') that produces a certain pattern when he *Bitcoin's* algorithm '*hash*' is applied to the data. When a combination happens, the miner earns a *Bitcoins* award (and also a service fee, in *Bitcoins*, if the same block was used to verify a transaction). The size of the prize is reduced while *Bitcoins* are mined.

The term '*mining*' was not adopted by chance and concerns the mining process of *Bitcoin* which was a technology designed to recreate the process of mining gold and precious stones in the virtual network. And just as mining takes place in the material world, *Bitcoin* mining is becoming increasingly difficult because peers are becoming increasingly scarce until the day when there will be nothing left to mine.

Bitcoin as a type of database that solves the multi-master replication problem of distributed systems because it has mechanisms that prevent conflicts, much the same as blockchain technology that ensures the spending of single outputs more than once.

The blockchain as *multi-version concurrency control database multi-master* achieves by design through its peer to peer consensus model and transactions with Bitcoin uses public-private key cryptograph.

Well, the transactions with Bitcoin allows a publicly auditable *per-row* permission scheme. Therefore, the problems that Bitcoin is experiencing are challenges for science and technology that are looking for ways to solve.

The reason is that in addition to security, reliability and freedom it has already been verified that this technology means the materialisation of *human rights* by providing greater dignity since it democratises the wealth for all people and especially to the isolated people or people where the banks dominate the economy as in developing countries.

The *right* to internet connection to communicate or access means of work provides human dignity since it allows the individual to belong to the global community or local fully. This also gives respect and recognition to the environment that each individual has chosen to live and develop himself.

The cryptomoedas embody the real potential to generate desired consequences in the world market by reducing poverty and making traditional banks change their behaviour relative to governments and people because they are experiencing competition on this scenery.

We are experiencing the tyranny by banks, undoubtedly, this is incompatible with democratic ideals. With competition, traditional banks will take their place: an agent of financial services in the economic sector and nothing more. The individual gains the freedom to manage his own financial life and frees himself from oppression.

About *monetary tyranny*:

> "Bitcoin is not about making rapid global transactions with little or no fee. Bitcoin is about preventing monetary tyranny. That is its raison d'être [...]. The timing of Bitcoin's appearance, and subsequent growth, is no accident either. If one follows the relevant sentiments and trends, it's evident that society was approaching a breaking point. Essentially, Bitcoin is a reaction to three separate and ongoing developments: centralized monetary authority, diminishing financial privacy, and the entrenched legacy financial infrastructure. An alternative money provider that was centralized would probably not survive long in any jurisdiction. The emergence of Bitcoin was baked into the cake already [...]. Bitcoin emerged as a natural response to the collapse of the current monetary order, to the constant reduction of financial privacy, and to a banking architecture increasingly damaging to the average citizen. Governments can not inflate Bitcoins. Governments can not take ownership of the Bitcoin network. Governments can not corrupt or devalue Bitcoins either." (Matonis, 2012)

It adds to the above idea the analysis made by the World Bank Financial and Private Sector Development Consultative Group (Ardic and Mylenko, 2011), their financial experts believe that the blockchain's technology and crypto-coins are a potential weapon against poverty and oppression. Bitcoin also has the potential to improve the quality of life of the poorest people in the world. Increasing access to basic financial services is a promising anti-poverty technique. According to estimates, 64% of people living in developing countries have little access to these services, perhaps because it is very expensive for traditional financial institutions to serve poor and rural areas.

The internet is the world's largest computing network. There are two important namespaces that allow us to find resources on the web: the IP address system and the domain name hierarchy. The DNS is the global infrastructure that maintains the domain name hierarchy coherent and manages the translation of domain names in the related IP addresses.

The registrars are authorised entitled to register domain names in a particular TLD to end-users. When the registrar receives a user's registration request, it verifies if that name is available by checking with the appropriate registry that manages the corresponding TLD. If it is, the registrar proceeds registering the name with the registry that, for its part, adds the new name to its registry database and publishes it in the DNS.

We are in the technological age that it will increasingly be based on ICT networks. In this field, it is clear that DNS plays more and more a strategic function in maintaining reachability of all nodes of this large, distributed system. Then, there is truly possible a blockchain distributed ledger from recording the same names, information and IP addresses for all internet-based services that DNS records today (Casalicchio et al., 2013).

When we are thinking about if it will be possible without a governing body like ICANN, we will conclude that anyone could propose a name with or without a TLD equivalent, and associate an IP address with it. No two people would be able to own the same domain, and there is nothing to stop domain names being traded as they are today.

But intelligent solutions make innovative use of ICTs to improve quality of life, efficiency, productivity and competitiveness of services. We can see more and more about IoT interconnecting devices, objects, and people together with AI to analyse and execute the huge volumes of data that follow. Thus, moving DNS to a distributed blockchain platform is technically possible.

At present, developed countries are already working to establish international standards for interconnection and communication of devices and establishment of interoperable, reliable and transparent services on the global scale.

This means relevant points when we see countries like China investing in Smart Economy and especially in the Eurasian Corridor, the East European continental extension to China where blockchain is the vehicle developing the Smart Economy in that region. This has been interesting to the oil producing countries negotiating through Smart Contract run away from economic sanctions in dollar deals.

A report released by the Cyberspace Administration of China said that the size of China's digital economy grew to 27.2 trillion Yuan last year, up 20.3% year on year and accounting for 32.9% of the country's gross domestic product (Xia, 2018).

IP-based networks are a key component in the IoT as it is the technology to offer cost-effective connectivity.

Whereas the 2030 Agenda for Sustainable Development from the Department of Economic and Social Affairs by United Nations (UN) is predicting that increases about devices connected to the internet will to treble in next 15 years, DNS servers means the strategic point to financial lives of people because is responsible for locating and translating the addresses of websites we enter into web browsers into IP addresses. Smart city ICT infrastructure needs to support openness and interoperability, which will only be achieved with coordinated adherence to international standards.

The authors argue that IPv6-based networks bring the virtually unlimited addressing scalability required for smart cities.

4 Standards, laws and the international taxation for new technology

In order to justify the methodology about this research and the subject studied bringing clarifies that will turn possible understand the interaction of norms, laws and taxation on the *cryptocurrencies* as an innovative socioeconomic system, there is a need to build the meaning and content of the transactions with these currencies. This will be done either now creating or sometimes innovating or sometimes extinguishing consolidated legal understandings but which for us will not be useful.

In this way, through the constructivist process it will be possible to direct the governance relationship with such coins without detracting from the purpose for which they are intended.

Included, in order to achieve the purpose of *blockchain's* creation and payment transactions with *Bitcoins*, the government authorities should concentrate their efforts in build a minimum rule to guarantee: security, a certain privacy and maintenance of the system.

The authors is starting this journey by recalling that the practical result got from all tools posed for monetary policy purposes is basically the manipulation of the money supply in the economy. To foster a stable and sustainable economic activity, banks manipulate the compulsory level and open market operations and the various regulations issued by the monetary authority of each country. Currently, the manipulation of the money supply occurs indirectly, by the direct influence on the interest rate.

This economic strategy benefits governments and banks unlimitedly. So, when people is claim about the necessity about the regulatory framework to smart economy, specially for the cryptourrencies, the rulers in developing countries is ignoring because it means a political decision that does not matter to these economic and social agents. The emerging economy threatens their power.

However, they would be interested as long as it will be a marker between victory and defeat in the elections. The popular pressure passes through the democratic ideal of freedom, and for such, the system of cryptocurrency is there and each individual can choose to use or not. So, electors will support the candidate who would agree with the system.

The authors dare say that the political interest gives signs of life on the part of the rulers who are commanded by the banks and they are aware of the popular pressure and the potential for taxation. The popular pressure is defined by the impotence of the governments in extinguishing this social event of economic reflexes that has its own independent life of state performance.

A minimal rule would only come to make transactions safer. It is not a matter of obedience to spurious interests treating the public good. If government's authorities agree with the financial system of payments within blockchain through virtual currencies, they will know that state powers to manipulate the economy and oppress the people would be weakened. The proper rule finds obstacles and walks through crooked alleyways. Understanding economic policy events is not something simple for the average citizen. The ideal of financial freedom to be achieved by the political path is conditioned to the education of society and represents a critical point in the democratic process.

The necessary notes were made, the authors will begin to make the trajectory to build the sense to guide the *RMIT* respecting the social event, function and appropriate content.

Taking this text as our material essence, this composes fit physical support that will lead us to the meaning that the presented event forces us to interpret. Thus, to fulfil such desideratum, the signs were semantically related to the objects meant. These form the necessary framework so that we can contribute to the theme by decoding it until it reaches useful rule to enable the building the *RMIT*.

In other words, this will be the trajectory that generates useful meaning in the international legal community for taxes and fees in a pragmatic view, with a small portion of logic according to the competent language that conforms to the international laws and those intrinsic to Brazil in order to allow the appropriate legal subsumption.

The social event introduced a relevant fact to the science of law, which when dissected proved to be interesting to the legal community and, especially, to the Tax Law. From the system referred to the *cryptocurrencies*, we take important signs similar to the traditional financial model to draw up proposals and extract the necessary content to fill stricto sensu legal norms with legal meanings in the hypothetical – conditional form in which the normative content can be systematised.

It is intended to outline the elements needed to build the RMIT for financial transactions within blockchain's technology with the virtual currencies. In order to avoid semantic inconsistencies I note the dichotomy between '*broad sense*' and '*strict sense*' of the norm. The former denote units of the positive law system, even though they don't express a complete deontic message. The second denote the complete deontic message, that is, they are meanings constructed from the statements put forward by the legislator, structured in the hypothetical-conditional form (Carvalho, 2015).

This is the mandatory trajectory to support this economic sector brought by *blockchain technology* and *Bitcoin* (the first one cryptocurrency), preserving its essence and function. If we steal from this path, we would falling in a improper method just seeking simply mutilating some of *RMITs* criteria for forcing the 'fit'.

The *RMIT* is characterised as a logical method of organising the text of Positive Law. It is the formula that organises prescriptive enunciates extracted from the legal texts for later interpretation and evaluation of the constitutionality of the taxes. In fact, the *RMIT* is a rule of pre-ordered behaviour to discipline the conduct of the taxpayer relative the subject holding the right to credit: government's authorities authorised to receive the tributary obligation.

The schematic and operational mode of RMIT results from the unfolding from '*logical-semantic constructivism*', leading to join the theory and practice of the investigation of the tax object to unravel the legal tax. In short, it is a legal rule in the strict sense, because its core is essentially the definition of the general and abstract rule able to identifying the minimum elements of the tax rule. It means a hypothetical-conditional judgment that conveys a hypothesis and a consequence.

Therefore, the entrance of *blockchain technology* and the *cryptocurrencies* is an event occurring in the world requesting a description in a competent legal language to establish the tax obligation link and identifying the taxpayer as a taxable person and the state as an active subject.

So, does the state have any right to demand some benefit from this economic chain? Would the participants in this economic chain be taxpayers with the duty to provision the tax liability? If cryptocurrencies are essential for freedom without interference from the state or banks, is there a link to establishing the tax liability?

In the sequence, the authors will be able to answer these questions because the assumptions adopted will allow the filling the necessary content for the answers. This

approach considers the tax incidence seeing to focus on subsumption and implication. Now, our first problem concerns about the legal behaviour from the Brazilian taxation when the tax law is considering the transactions within blockchain only as financial assets.

Logically, in establishing subsumption, the event examined is recognised as an integral element of the class of facts predicted in the supposed general and abstract norm. However, when treating the transactions with *Bitcoins* with the blockchain technology only as a financial asset subject to income tax, the *RMIT* is unequal from the general and abstract norm because the material criterion is not the same.

The reason why there is the imperfection in normative framework when classifying just as a financial asset is that current laws and regulations have not yet dealt with an innovative technology such as *Bitcoin* and it brings to scenery some legal gray areas emerging. One, this is because *Bitcoin* does not fit into existing regulatory definitions of currency or other financial instruments or institutions, making it complex to know which laws apply to it and in what form. And to two, because we are faced with complex operations with varying results and that a single or excluding view is not correct.

Bitcoin and all other cryptocurrencies there are legal nature as *sui generis* because they have properties similar to electronic payments, but sometimes they conform to commodities and other currencies. The degree of complexity in this performance is high.

Looking to Brazil, they are thinking about regulating the sector. But currently, the legislation of Brazil considered a criminal offence investments and business with cryptocurrencies. It means the fraudulent uttering of counterfeit currency, Art. 289, Criminal Code and a crime of fraud, Art. 171, in the same code.

The regulatory framework has become one of the biggest debates in all countries because the smart economy is growing rapid and solid as a alternative to classic financial system.

The US more than 60% of US companies is establishing ways to viable operations with the virtual currency that is not limited to Bitcoin. The Japan in April 2017 passed a law making Bitcoin a legal payment instrument.

In turn, in Denmark the government and the Financial Supervisory Authority have announced that business with Bitcoin will be taxed in the same way already as existing taxes, but that taxpayers will not be subject to taxation when performing foreign exchange transactions. Even Denmark's central bank is considering digitising the country's currency, which would be called e-*Krone*. In Germany and most of the European Union countries, the German Federal Ministry of Finance has a position that bitcoin should be seen as a unit of account and private money and therefore should be subject to sales tax and *IVA* (tax to asset increase).

In Brazil, public hearings have been held since July/2017 and resulted in Bill No. 2303/2015 and provides for the inclusion of virtual currencies and air mileage programs in the concept to 'payment methods' under the supervision of the Central Bank (amending Law 12,865 of 2013 and Law 9.613 of 1998). The situation of *Bill* 2303/2015 until April 2018 received the legal advice to constitutionality, legality and legislative technique but there was no pronouncement as to financial and budgetary adequacy; and, on merit, by approval.

However, the authors understand that the Bill is a way to manipulate and to appropriate of this technology. This way, it will be possible to subject the control over blockchain and cryptocurrences under government control in the transactions with

Bitcoins and by blockchain. This means a point of view from a person that is worried just about getting benefits to himself and no for collective purpose because the strategy is allows the control of the *Central Bank*.

In defence to this point of view, the *UN* and its telecommunications agencies consider the system as part of the telecommunications system and this is one of the attributes that makes *blockchain* and *cryptocurrency* international property protected by *human rights* as a material instrument of freedom propagated by a change in the content of the communication and therefore, impossible to be appropriated by a country.

The Department of Economic and Social Affairs of the United Nations through the Development Policy and Analysis (UN, 2018) division is in the process of adopting *blockchain's* system and cryptocurrencies through the use of Bitcoin and Ethereum as a way to reduce poverty. There is currently a *World Food Program* (*WFP*) among these measures and has been organising a pilot test, scheduled to begin in Jordan where the *WFP* will send an indeterminate number of dinars to over 10.000 beneficiaries who need financial support and extra food, with the goal of increasing the number of receivers to 500,000 people still in 2018.

The gray area has been delimited and considerations about international legislation and regulation are noted, as well as the status in Brazil for blockchain technology and its role in the cryptocurrencies system. At this point we are able to verify the possibility of constructing a tax incidence matrix rule (*RMIT*) for this complex system.

5 Dialogue between RMIT and blockchain technology

To continue, we must adopt a useful concept for cryptocurrency and their role. I will adopt the concept of Michael Doran from the Sans Institute in the USA (Doran, 2015):

> "Cryptocurrency, by definition is a type of digital currency based on cryptography, or the process of converting plaintext into ciphertext, thus making readable text non-decipherable (Rouse, 2009). The use of cryptography in the transfer of data has four main objectives: 1) confidentiality – the information cannot be understood by anyone for whom it was unintended to be (Rouse, 2009); 2) integrity – ensuring the information sent remains unaltered (Rouse, 2009); 3) non-repudiation – the sender of the information cannot deny that they sent the information at a later date and time (Rouse, 2009); 4) authentication – the sender and receiver have the ability to confirm each other's identity and the origin and destination of the information (Rouse, 2009)."

Currently in Brazil, the *Federal Revenue Service* has treated virtual currency as a financial asset. There is no adequate legal framework considering the different results from transactions and, consequently, there is no legal rule foreseen for the conversion of the amounts for tax purposes. The recommended by the *Federal Revenue Service* is that the financial asset must be declared, and will suffer incidence of the *income tax* (*IR*) by disposal of assets, because this is the moment of the equity increase, considering the value of the acquisition. By equivalence, it will follow all or relative rules about Income Tax to companies or personal, according the case. *ITCMD* (*tax on the transmission of assets by death or donation*) will be possible and it will also follow rules when donations are possible to be proven by skilful documentation.

The Brazil's justification for acting this way is that there is no possibility of the Bitcoins wallet being tracked by any country and therefore the Federal Revenue Service have not resources to verify the quotation or historical values. Only the equity increase that goes to the classical financial institutions will be visible.

It is noteworthy, there is already a virtual and international business field where Bitcoins can be consumed in hotels, parks, restaurants where the exchange takes place in *blockchain* market without going through any financial institution. In this case, the equity increase is invisible, but not illegal. There is no possibility of criminalising an event that is not described in the law as a crime, *Section 1 of the Brazilian Criminal Code*.

As an example about the business with the *blockchain* and Bitcoins technology, there are hotels are being built entirely with resources from *ICO* and in countries where there is no influence of antitrust laws. Such a procedure is not typical of money *laundering* laws because there is no illicit activity.

In the exemplary case above, the building of a hotel with financial resources acquired through investments in *ICO*, and then, it will be operated with tourists who hosted in this hotel and they will pay for their daily with the wallet of *Bitcoins*. Well, there are the following transactions: credit and service operations through the exchange and not the typical sale as it is currently configured.

Because all financial transactions occurred virtually with the exchange within the *blockchain* database where computers make various trading operations solving mathematical problems to find the correct algorithm that results in *Bitcoin* rate. In this case, there was no physical asset increase to be checked and there is no legal provision to investigate crime for lack of illegality.

Obviously, rulers have already thought of legislating to criminalise such transactions, but this would distort the system and would be legislative efforts depleted by the death of *blockchain's* own financial system. It concludes the idea that they want the death of the system. Initially, I said that market forces leave governments and banks with their hands tied and powerless. Market forces are obstacles that prevent the death of *blockchain technology* and *cryptocurrency*.

The system is independent, freely created without increasing costs or damaging the governs. Included, it received support by the UN as a way of eradicating poverty. According to Garcia (2016), the financial system provided by blockchain technology means a democratic concept about the "Tape to contention to state greed and obliges them to fulfil the public commitment."

The system is only subject to *ICANN* intervention because the root's zone addresses moved by *DNS* registers are the basis for blockchain's move. However, this is minimal control since *ICANN* does not address the content of messages.

From the researchers' point of view, in relation to any digital resource that is labelled as cryptocurrency, it will depend on the characteristics and use of that resource considered in particular. And so, to determine the correct *RMIT* since there are different *ICOs* with different purposes, treated differently.

Carefully considered, about the scenery inside transitions with blockchain and Bitcoins, there are requests from individuals who operate or mine in the ICO market desiring the minimum rule to comply with the rules of compliance depending on governance activity. *The reason is that transactions have principles that are being followed by those who operate responsibly: freedom, security, soundness, reliability, and integrity*.

And to achieve this goal, the United States already discusses in Congress the *Bill HR 3708/2017* of the idealisers Jared Polis and David Schweikert. The objective is only tax the surplus to $600 dollars. Gross revenue will not include gain from the disposal of assets or exchange of virtual currency by currency other than cash or cash equivalents, *Sec. 139G, A*. The same bills define virtual currency as a digital value representation that is used as a means of exchange and not otherwise, *Sec. 139G, C*, (Congress from United States, 2017). 4 July 2018 marks a regulatory framework to Maltese Parliament that has officially passed three bills into law, establishing the first regulatory framework for blockchain, cryptocurrency and distributed ledger technology (DLT):

a Virtual Financial Assets Bill

b Malta Digital Innovation Authority

c Innovative Technology Arrangements and Services (ITASA BILL).

Malta was the first country in the world to provide an official set of regulations for operators in the blockchain, cryptocurrency and DLT space.

This concept of cryptocurrency conforms perfectly to the content and purpose of the system of blockchain and Bitcoin like other criptomoedas also and without mutilating the functionality. These are exchange transactions that result in the acquisition of Bitcoin or other cryptocurrency and it will only be securities when traded in that market through stock exchanges and described in securities.

The quotation and on the basic premises for appropriate rule that the authors is building, under the cloak of *semantic logical constructivism*, after the methodological cuts necessary, they are stating that when this is the case and the transaction is assuming the characteristics of the securities, it must be registered with the Securities and Exchange Commission respective to each country.

About services, it can fit into the concept of 'information's exchanges' because the circulation through the internet is a communication (database) is by the technology of blockchain making exchanges all the time and certainly the result will be the execution of an activity, but the RMITs material core is the exchange and not the obligation to make singly.

> "However, bringing fresh air to the compendium, if there is a mix between virtual currencies and the current currency of a singly country by banking institutions within the transactions, the RMITs material core should follow the tax laws of physical money because the RMITs material core lost the intrinsic characteristics of the cryptocurrency when it involves classical banks. Such as: independence, transactions without involves banks or state performance; and, exchange ratio replaced by financial transaction."

After these considerations, the researchers ensure that is possible to create a *RMIT* for this financial system with *blockchain technology* to transactions with *Bitcoin* or other *cryptocurrency* with criticisms of the legal nexus to establish *tax liability*.

At moment, after analysing the social event and building the sense and content for the legal tax fact, it is possible filling the topics of RMIT to Bitcoins (or another cryptocurrency) transactions by removing the complexity of blockchain technology.

To the previous concept that they adopted about cryptocurrency, it will add a limit to tax that was drawn in the *American Bill of HR 3708* and consider a value for tax exemption guaranteeing the volatility of the activity and freedom with certain limitation to fulfil the rules of compliance. The ceiling is $600 like a social application.

To *antecedent* in RMIT we would be instituting: *material criterion:* 'exchange' mined algorithms (verb + complement). Considering the verb 'to exchange' we are considering singly the computational activity in the search for the correct algorithms. Therefore, there is no increase in equity to justify income tax at that time. *Spatial criterion:* blockchain. It is virtual communication system within the internet network. There is no financial institution involved in justifying the IOF or a specific country hosting the transaction. Although blockchain uses the internet, this is the way technology connects to move around. This approach differentiates transactions with Bitcoins within blockchain from other transactions with banks that also use the internet as a means of accomplishing the task. *Temporal criterion:* the moment the service fee in Bitcoins arises. It is the moment of the last signature (*hash*) in which Bitcoins will enter the *wallet* for the miner. This will occur because, at initial step in chain, the miner shares an address indicating the final recipient.

To *consequent* in RMIT we would be instituting: *personal criterion: tax agency* (active person and authorised to receive the payment from tax payer) and *taxable person*. To Brazil, the *active person* (*tax agency*) is will be the Federal Revenue Service because it is an international transaction where the federal government has exclusive competence to legislate (*Section 22*, *VII*, *CF/88*) and it may impose tax on international financial circulation, (*Section 53*, *V*, *CF/88*). I shall write down my criticisms of the obligatory bond instituted in this way, on final. There is grave legal harmful that concerns to legal nexus to impose taxation. Taxable person is the miner who acquires the rate and prizes of *Bitcoins* or other cryptocurrency. *Quantitative criterion:* calculation base and aliquots. *Calculation base* will be defined by the Bitcoins rate paid to the miner. *Aliquot* should be marked by the values related to human rights and the limiting impose by constitutionals and tributaries principles able as a obstacle to the state force to tax with excessive greed.

The mandatory nexus able to impose the tax arises with existing laws within the country that justify the collection of abusives taxes to maintain the activities of the state. Remember it: constitucionalidade e moralidade pode ser diferente de legalidade quando leis são instituídas à luz da corrupção parlamentar.

At this textual moment, the authors are standing up because they got difficulty to agreeing with this way to applying the law just when it is imposed to the system within the blockchain. They states that one of the juridical natures to justifying the existence of smart economy is to attend to the greatest democratic ideal: the *public will*.

The blockchain technology is independent of governmental performance, which means that there is no obligatory nexus required to tax when the cryptocurrencies does not enter the traditional financial system or adding costs to state possible to place harmful to public interests. Then, is necessary the government give up of taxation's hunger to become the economy stronger. This way, the country will increase the *gross national product* (*GDP*) through the stronger consumers paying taxes when they are paying for services and products.

The legal nexus just will be possible when there is the mix between cryptocurrency and financial institution. This is because the legal nature of the transactions within blockchain with Bitcoins is humanitarian and this will avoid that states and banks to enrich themselves at the expense of humanity's poverty. The investments made by speculative companies must be treated differently from the citizen who invests in the long-term with the objective of self-management the financial life in an independent way because it will increase the GDP.

6 Conclusions

The technological innovation brought by *blockchain* technology to provide financial transactions with virtual currencies, *Bitcoins* being the best known of them, as an object of analysis focused on the socioeconomic event (disruptive theory and smart economy), describing it in legal language competent to know the legal tributary fact led the researchers to construct the interesting sense to the *Law Science* under the prism of the *International Tax Law*.

There is a technical – legal impossibility to treat this legal tributary fact only in the angular view of the *Brazilian Tax Law* because we are talking about an activity with economic reflexes and cross-borders by its own raison *d'être'*.

Despite the legislation and regulations are showed us insufficient or inadequate, the theme was not exhausted in this study because it is quite possible that it will still through a many interactions and changes. *Blockchain* is a technology with high integrity and endless possibilities that has been presenting itself as a guarantor of security of virtual signatures and it is still a field to be explored along side of AI.

The philosophical school that privileged the *logical-semantic constructivism* has allowed us to choose the appropriate premises to build the necessary sense to verify the viable content to establish the *matrix rule of tax incidence* (*RMIT*) for the transactions with Bitcoins and others cryptocurrency.

There has been concentration of research in the tax field, however, there are many aspects to be considered such as: new jobs, indirect global wealth generation, human rights issues, and more. Indeed, the humanitarian issue is an obstacle to establishing the legal nexus to *tax liability*.

Several crises are today playing out on the world stage, simultaneously. Democracy is threatened by autocratic governments which use fraudulent elections to wrap themselves in a veneer of democratic legitimacy and the *smart economy* is working with the *cryptocurrencies*, a new form of money rooted in freedom that for the first time in world history marks the possibility to people living released of the central body controlling their financial life. It became possible through this first truly global currency.

The raison *d'etre* to *smart economy* privileges individual freedom and the development of civilisation with extraordinary consequences and without historicity that precedes it.

Blockchain gives humankind the opportunity to earn money honestly and ethically by opening up new jobs in a world that no longer offers jobs for everyone, the traditional money is scarce and corruption enriches politicians, banks and governments at the expense of impoverishment of humanity.

This research brought evidences to show reasons sufficient to justify the protection from *human rights* to *blockchain* and *cryptocurrency*. In fact, the UN is engaged and working to demonstrate the need to create an option to the current financial system.

In addition, democratic principles are incompatible with any model of dictatorship, and therefore, is impossible to admit that banks play the role of tyrants.

The *RMIT* proved possible when we admit the existence of the mandatory legal nexus between the State and the taxpayers within the blockchain through legal requirement if, and just in case, we are admitting that the governing authorities can tear apart the primary public purpose and they will replace it by spurious purposes treating the collective good.

Finally, the authors note that the new technology comes with greater financial freedom, independence of governmental action or banking institutions and it allows the

eradication of world poverty. The results and reasons extracted from the research it isn't possible to glimpse the legal nexus to support the RMIT about income taxes or another that become meaning the *double taxation* due to absence of the factual reality required to meet requirement the substance to legal norm.

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