





THE INFLUENCE OF INSTITUTIONAL VOIDS IN THE INSTITUTIONALIZATION OF BITCOINS AS A CURRENCY

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ABSTRACT

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Bitcoin is a social movement, which promises free and decentralized money, absent from the traditional regulatory institutions, but it can be challenging for financial industry regulators and other players in the financial markets. Thus, our study aims to analyze how the institutional voids manifest in the bitcoin institutionalization process as a currency. We adopt the institutional theory, from the perspective of institutional voids, in order to observe the concepts in emerging markets that show the difficulty or the beginning of the institutionalization of bitcoin as a currency. The institutional theory provides an opportunity to understand the reasons for using particular practices, actions, or manifestations. Our method is based on a qualitative exploratory approach with semi-structured interviews to understand how financial market experts perceive this phenomenon. Our results show that it is possible to identify how institutional voids manifest themselves, reinforcing the debate on whether bitcoin is, in fact, a currency.

Contribution/Originality: This study analyzes bitcoin as an economic object through the logic of institutional voids. Thus, with the institutional perspective as a background and theoretical support, it is examined how the institutional voids are manifested in the process of institutionalization of the bitcoin as a currency.

1. INTRODUCTION

Technological innovations dynamically change scenarios and contexts. Institutions have a prominent role in society by directing political and social actions, supporting economic events and providing stability. Institutionalized values and concepts in society become myths and ceremonies (Meyer & Rowan, 1977) providing greater security and certainty after the legitimation of an event (Bachmann & Zaheer, 2009; Suchman, 1995). The institutional theory works as a background, supporting the understanding of economic, political and social contexts, realities, changes and transformations (Berger & Luckmann, 1967; Scott, 1987). Thus, understanding the influences that provide legitimacy presupposes increasing stability in an institutionalization process.

To advance in the institutionalization stages, it is necessary to go through processes that involve the generation of new structural arrangements in response to existing problems or sets of problems (Tolbert & Zucker, 1998) suggesting that some social patterns and behaviors may be modified. In developing markets, institutions are likely to be unprepared or absent from institutionalization processes that, sometimes and as they develop, may be filled by the emergence of new institutions (Ahuja, Soda, & Zaheer, 2012) showing that institutions are flawed or non-existent, that is, institutional voids (Khanna & Palepu, 1997). In this sense, institutional voids are characterized

by information asymmetry, misguided regulations and inefficient legal systems that affect the product market, capital, labor, regulations and agreements' implementation (Khanna & Palepu, 1997, 2000; Mair & Marti, 2009; Mair, Martí, & Ganly, 2007). The evolution of the currency in its original form went through various stages and transformations. Barter, "salable" commodities (Menger, 1892) metals as coins, until it reaches paper money (Dodd, 2013; Maurer, 2006; Nian & Chuen, 2015a) are some of the stages of this evolution with an obvious purpose: the simplification of exchange between individuals. At the same time, emerging technologies bringing innovation and new opportunities. Cryptocurrencies, specifically bitcoin, are known as a peer-to-peer digital currency network with proof-of-work (Nakamoto, 2008). With disruptive characteristics, bitcoin has its proposal as currency based on logical and independent programming of a formal regulatory institution, such as Central Banks, and far from the governmental authority that can manage its operations. While bitcoin is still far from the fundamental properties of a currency and is not effectively characterized as such, it takes steps towards its consolidation.

Thus, with a series of deadlocks, bitcoin can be challenging for financial industry regulators and other players in the financial markets, such as regulated banks, financial firms, exchanges and central clearinghouses (Karlström, 2014). Finding efficient mechanisms that provide security for the market and understanding which regulatory and cultural influences may impact the legitimacy process is part of this challenge (Carrick, 2016). Therefore, we adopt the institutional theory, from the perspective of institutional voids, to observe the concepts in emerging markets that show the difficulty or the beginning of the institutionalization of bitcoin as a currency candidate. Thus, our research question is: "How are institutional voids manifested in bitcoin's institutionalization process as a currency?"

The mechanisms offered by the institutional voids contribute to analyzing emerging markets (Khanna & Palepu, 2000; Mair et al., 2007; McCarthy & Puffer, 2016) comparisons between nations (Puffer, McCarthy, & Boisot, 2010) and even internationalization processes (Amankwah-Amoah, Danso, & Adomako, 2019; Tracey & Phillips, 2011). However, they do not include the evaluation of new products and services, such as shared economy, Uber or Airbnb, for example (Berger, Chen, & Frey, 2018; Oro Boff & Alves Ferreira, 2016) or with a new payment method such as bitcoin (Berger et al., 2018; Nakamoto, 2008; Yermack, 2015). Thus, the sources of institutional voids are used as a starting point (Khanna & Palepu, 1997). Based on them, situations that may impact performance are identified and categories of analysis are created.

Our study analyzes bitcoin as an economic object through the logic of institutional voids. Bitcoin is an emerging phenomenon that has gained popularity, user acceptance, and attention from the media, economists and regulators for being relevant to the global financial market (Feng, Wang, & Zhang, 2018; Gajardo, Kristjanpoller, & Minutolo, 2018; Urquhart, 2016) with nearly 18 million bitcoins in circulation representing about 85% of the total amount to be mined. While bitcoin promises to be a disruptive payment system through transparency, innovative features, technological design and low cost (Gandal, Hamrick, Moore, & Oberman, 2018) its legal and institutional status still must be developed (Kristoufek, 2018). Consequently, most studies have focused primarily on technical (Levin, 2013) legal and financial issues (Gandal & Halaburda, 2014; Hill, 2013; Kristoufek, 2018; Mills et al., 2016) leaving an avenue for the institutional view. In these terms, the next section addresses the institutional voids.

1.1. Institutions and Institutional Voids

Institutions are the results of men's actions in the way they think and in the way they produce their actions. The institutional theory provides an opportunity to broaden knowledge about institutions and to understand the reasons for using particular practices, actions, or manifestations (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 2008). Institutional practices derive from the concepts of rationality in which there is no optimal decision making, but one that best fits a given context (North, 1990).

Multiple events cause institutions to arise so that uncertainties in exchanges, the influence of the environment, organizational actions, and society, in general, take place, with this being a factor that enhances the importance and the need to legitimate social actions (Carvalho, Vieira, & Silva, 2012; Suchman, 1995). In economic, social and

political relations, uncertainties are the result of uncontrolled actions that can have priceless consequences for the organizations (Zaheer & Zaheer, 2006). Uncertainties are independent variables and not a fait accompli; decision making includes flaws, lack of information and rational limitation of the decision-makers (Simon, 1972). This requires safeguarding effects to secure the widest possible range of guarantees so that in the event of a failure, the losses are reduced. From the need to understand the flaws in the current institutions that regulate economic and social actions, institutional voids are observed (Agostini, Marques, & Bossle, 2016; Khanna & Palepu, 2000; Mair et al., 2007; Tracey & Phillips, 2011). Thus, risks and opportunities are offered in unprepared or inefficient institutional environments, where the evolution of the institutional context may change value creation (Khanna & Palepu, 1997, 2000). Institutional voids start from three main sources of market failures that lead to imbalance or inefficiency of the operations: information asymmetry, misguided regulations, and inefficient legal systems. First, information asymmetry and problems due to the different information hinder market development. Information asymmetry creates uncertainty, risks, inhibits stock investment and increases transaction costs (Williamson, 1985) which undermines economic and social development. In some emerging markets, lack of information, unreliable information or absence of institutions may occur (Mair et al., 2007). This asymmetry of or lack of information can lead to certain economic and social actions to uncertain paths.

Second, there is the concept of esteem for regulations as a stabilizing link, but it can also be a constraint on the development of leading-edge organizations, products, and services if the market is wrongly regulated or if there are too many restrictions or regulations that do not allow their development, given the ambiguous nature of the institutional arrangements in the markets (Tracey & Phillips, 2011).

Third, there is the concept of inefficient legal systems, where businesses depend on reliable systems to develop. There needs to be transparency and a set of instruments that are consolidated and following the current economic setting (Nicoletti, 2017). In an economic and social environment, where there are institutional failures such as spaces for the opportunity (Mair et al., 2007) any of these conditions may impact the performance efficiency, blocking the entry of new players or restricting the welfare conditions of the population. Based on the sources of institutional voids and their manifestations, it is possible to evaluate the institutionalization process of the bitcoin as a currency, so that institutional voids are often filled by the emergence of new institutions or the strengthening of the prevailing institutions.

1.2. Currency Evolution and Bitcoin

The evolution of the modern society about money can be discussed from various social theoretical lenses, especially the economic approach that aims to diagnose the nature of the monetary problems arising from the existence of currencies and their market exchange functionality (Lawson, 2016; Zelizer, 2007) and its impact on macroeconomic events. Money as a currency is a part of the determination of money to be a medium of exchange but assumes other determinations throughout its movement (Corazza, 1994). Currency and money, in this paper, are used as synonyms. Money is issued by governments. Thus, it has been used as a monetary policy tool, relying on important events such as inflationary control and support for currency fluctuations (Dodd, 1994; Karlström, 2014). Contrary to common sense, money has no value in banknotes, but it is based on the trust attached to the institution or the state – an issuer which guarantees, through its sovereignty, the necessary conditions for its commercial usability (Dodd, 1994). In economy, with complex activities related to the production, distribution, exchange and consumption of resources (Truzzi & Neto, 2007) money has important functions in the economic system so that efficient exchanges are established: as a means of exchange, as a unit of measure, and as a store-of-value (Ferracioli, 2016; Yermack, 2015).

Supported by the technological revolution, money traded electronically is already intrinsic to everyday life since practices in the contemporary economy are surrounded by actions focused on their dependence (Pérez, 2009). The phenomenon of bitcoin and cryptocurrencies that are embedded in a conceptual duality concerning the

principles of currency, emerged as an alternative to the fiat currencies. Its general functioning is based on a set of cryptographic rules that allows the issuance and authorization of transactions in a decentralized model, without the occurrence of a linked monetary authority (Böhme, Christin, Edelman, & Moore, 2015; Nakamoto, 2008). Its essential feature is that it transacts and settles its own currency, protected against a double settlement, with the authorization process and decentralized currency generation, in a public and open ecosystem (as opposed to a conventional payment system (Nakamoto, 2008). In these terms, bitcoin relies on a set of nodes into a peer-to-peer network that represents the transactions. All transactions must be published in a global permanent transaction log that needs a script verification to be successfully published. The log is implemented as a chain of records of transactions and bitcoins, resulting in the so-called blockchain. Miners add to the blockchain by solving a computational problem and adding new transactions while receiving bitcoins (Dwyer, 2015).

Cryptocurrencies are considered synthetic commodity money or *new gold* because they are not linked to any monetary policy instruments or fundamentals, the primary value is due to scarcity of supply that is not controlled by governments, having protocols based on anonymity, low cost and fast speed of peer-to-peer transactions, and being a commodity money in being scarce (Böhme et al., 2015; Dyhrberg, 2016; Klein, Thuc, & Walther, 2018; Yi, Xu, & Wang, 2018). Among cryptocurrencies, bitcoin is significantly distant from others, such as *Ethereum*, *Ripple*, *Bitcoin Cash*, *Litecoin*, especially as a precursor to its processing model based on the open *blockchain* (Bariviera, Basgall, Hasperué, & Naiouf, 2017). The social and economic impact has attracted the attention of financial market regulating entities, given its bearer anonymity, price volatility and electricity consumption, and may encourage illegal activities, cybersecurity worries and fears of the government raising taxes (Fry & Cheah, 2016). Consequently, countries have ignored (e.g., Portugal, Thailand), regulated (e.g. Brazil, Russia), or even banned (e.g. Bolivia, Indonesia) bitcoins transactions (Bajpai., 2019).

As a new fact in trade relationships, cryptocurrencies depend on a complex institutional structure to acquire social and, consequently, economic efficiency. Bitcoin depends on several support conditions as financial inclusion (Lim, 2015; Mas & Chuen, 2015) lower carrier transaction costs (Mas & Chuen, 2015; Nian & Chuen, 2015a, 2015b) and the financial settlement having no banking time restrictions, for example. Bitcoin can be considered a technological solution to monetary governance problems, such as inflation (Dodd, 2017) as currency issues are controlled and programmed to occur in cycles already defined in a *blockchain*, thus avoiding that its issuance is due to an arbitrary measure or political convenience. It is also an opportunity for investment in variable income, an effect of bitcoin's price volatility (Blau, 2018; Maurer, 2006; Pieters & Vivanco, 2017). Another characteristic is the traceability of the transaction via the *blockchain* (Lemieux, 2016; Nakamoto, 2008).

On the other hand, there are bitcoin restrictions that need to be observed and require development, research, and improvement. These conditions generate debates due to the level of controversy and economic and social risk. Among them is the exempt to respect the rules of *Know Your Customer* and *Anti Money Laundering* (McKinney, Shao, Rosenlieb, & Shao, 2015; Papadopoulos, 2015; Pieters & Vivanco, 2017) bitcoin's volatility debates, as a variable-income investment, indicate risks, especially due to the uncertainties of the phenomenon regarding the origin of the volatility (Dodd, 2017; Pieters & Vivanco, 2017; Yermack, 2015). As a consequence, volatility itself is questioned about its characteristics and similarities to a speculative bubble, the limitation of the currency issuance, and consequent deflationary effect, since the money supply would not increase after an economic growth (Yermack, 2015). Another point is the excessive consumption of electricity used by miners in the process of creating new bitcoins and by validating transactions on the *blockchain* network (Dodd, 2017; Dwyer, 2015). Finally, there are questions about the unknown origin of Satoshi Nakamoto, as well as the true intentions of someone or group unknown, even though their predictions of cryptocurrency development have come true (Karlström, 2014; Maurer, Nelms, & Swartz, 2013; Nian & Chuen, 2015b). Table 1 summarizes the sources of institutional voids and the impacts on bitcoins.

Table-1. Sources of institutional voids applied to bitcoin.

Sources of Institutional Voids	Institutional voids for bitcoins	Theoretical background
Information Asymmetry	Need for reliable information for decision making Price asymmetry, volatility, acceptance Exchange rate versus Bitcoin quotation Users with different information: quotation formation, usability, modus operandi, security.	(Blau, 2018; Carrick, 2016; Dyhrberg, Foley, & Svec, 2018; Pieters & Vivanco, 2017; Presthus & O'Malley, 2017; Yermack, 2015)
Regulations	Inefficient mechanisms may restrict product or service development Currency issuance and transaction regulations are transparent, formal or definitive Standard financial regulations may impact the bitcoin's market (non-use of KYC) Low dependence on intermediary sources in the transactions Risks due to the lack of regulation	(Bartos, 2015; Böhme et al., 2015; Carrick, 2016; Dodd, 2017; Dwyer, 2015; Karlström, 2014; Papadopoulos, 2015; Pieters & Vivanco, 2017; Rainero, Puddu, Migliavacca, Coda, & Modarelli, 2019; Yermack, 2015)
Legal Systems	Lack of an open identification of the carrier Developing markets and innovative products may be disassociated from the institutions Lack of formal written agreements to guarantee transactions or price quotation Protection of non-existent property rights Lack of a legal tender	(Böhme et al., 2015; Bollen, 2016; Oro Boff & Alves Ferreira, 2016)

2. METHODOLOGY

We conducted qualitative research using an exploratory case study approach (Flick, 2009). The case study is an appropriate method for the type of investigation proposed, as our objective is to understand whether and how a complex and little-explored phenomenon takes place (Yin, 2010). Our analysis uses theoretical relationships, by applying the institutional voids to study bitcoins. Bitcoin is suitable to the study objectives because it is a recent phenomenon dealing with several barriers to its institutionalization as a currency, based on the legitimacy of the process and not in the trust state or bank.

We conducted 12 in-depth semi-structured interviews with professionals with expertise in the financial market and connection with cryptocurrencies. The interview participants will be chosen to suit the purpose of this study and based on who could have relevant insights to research. A so-called snowball sampling of further contacts is started. A snowball sampling is a type of non-probability sampling, which starts with someone that meets the criteria for participating, who will further recommend others who meet the criteria and could participate (Easterby-Smith, Thorpe, & Jackson, 2012). The interviewees were segmented into two groups in order to show their contexts. Each position is seen regarding the same phenomenon. The first group includes the influencers, people in the cryptocurrency market, such as entrepreneurs, owners, and operators of exchanges, managers, engineers, economists, and lawyers, who contribute to the ecosystem by spreading explanatory content in periodicals about this topic. The second group, called traditional, includes people linked to the traditional financial market, such as professionals, credit card brands and banks, legal professionals and researchers who work in the financial sector, where the interest in the bitcoin institutionalization can lead to structural changes in their *modus operandi*. For both groups, the same interview script was applied. For discussion and analysis, the answers of the respondents were used, and the following identification was adopted: R1 to R12 Table 2.

We recorded and transcribed all interviews, generating about 11h of recordings. We collected secondary data from the interviewees' institutions to complement and contrast with information from interviews, plus bibliographical material such as websites, magazines and books. These data were all used for data triangulation with the objective of increasing validity and reliability (Collis & Hussey, 2009).

Table-2. General data of the interviews.

Code	Category	Profile of the respondents	Occupation	Duration
R1	Traditional	Bank clerk; working in the financial market for more than seven years and with cryptocurrencies for four years.	Manager	36 min
R2	Traditional	Bank clerk; working in the financial market for more than seven years and with cryptocurrencies for two years.	Economist	44 min
R3	Influencer	Lawyer, Professor, Master's degree in Law, Researcher on innovation, businesses, and laws. Has known about bitcoins for four years.	Lawyer	1:08:00
R4	Influencer	Lawyer, Technology enthusiast, Researcher on European law, innovation, and cryptocurrencies. Has known about bitcoins for more than five years.	Lawyer	1:16:00
R5	Traditional	Sociologist, postdoctoral fellow in economic sociology, professor and researcher on new markets, consumption and social movements, and economic-sociology of money.	Professor	1:05:00
R6	Influencer	Lawyer, researcher on economic analysis of law, contractual relations, and blockchain. Has known about bitcoins for about three years.	Lawyer	1:18:00
R7	Traditional	Chief economist of an institution in the card market; worked in the design of structured financial instruments in the stock market.	Economist	43 min
R8	Influencer	Entrepreneur, Ph.D. in Business, specialist in strategic management, professor in the areas of innovation and information technology.	Manager	52 min
R9	Influencer	Information technology specialist, works in the cryptocurrency market and has known Bitcoin for nine years.	Engineer	1:05:00
R10	Traditional	Legislator, Ph.D. in law, specialist in international law, policy and strategy, and professor of international law and contract law.	Lawyer	59 min
R11	Traditional	Public servant, lawyer, intelligence specialist, linked to the National Intelligence Department, works in technology investigation and research.	Manager	1:07:00
R12	Influencer	Professional connected to businesses that explore technology and new business models. Experience with research and development, teaching, financial market, innovation and startups, has a master's degree in computer science.	Entrepreneur	48 min

The script used in the interviews was primarily based on the literature about institutional voids (Khanna & Palepu, 1997) and encompasses four categories: (a) evaluation of the historical evolution of the currency as a connection for the bitcoin analysis; (b) reliability of information; (c) role of the regulating entities, given the regulated role of the use of traditional currency; (d) role of the legal system as a means of protecting individual rights and disciplining Table 3. Thus, the sources of voids are the categories that suggest subcategories.

Table-3. Categories and subcategories.

Category	Subcategory	Theoretical Background
Currency contextualization and bitcoin definition	Currency History, Bitcoin Acceptance, State Influence on Regulation, Bitcoin Guarantees, Economic and Social Impact	(Böhme et al., 2015; Dodd, 1994; Karlström, 2014; Maurer et al., 2013; Menger, 1892; Nian & Chuen, 2015a, 2015b)
Importance of Information	Information Reliability, Debates, Volatility	(Khanna & Palepu, 1997, 2000; Mair et al., 2007; Nicoletti, 2017; Tracey & Phillips, 2011; Williamson, 1985; Zaheer & Zaheer, 2006)
Role of the regulatory institutions	Rules, Positioning, Governance, Identity, Intermediation	
Role of the legal systems	Property, Legality, Disagreements	

For data analysis, we followed Miles, Huberman, and Saldaña (2019) initially with a pre-analysis of the data collected and exploration of the material. Afterward, the discussion was unfolded in the light of each source of institutional voids.

3. RESULTS AND DISCUSSION

3.1. Importance of Information

Contemporary society is impacted daily by a series of information, such that the dynamics of decision making must be quick and strategic while reconciling flexibility with consistency. Invariably, cryptocurrencies, and especially bitcoin, are impacted similarly. With the independent proposal of a centralizing monetary institution (Böhme et al., 2015; Nakamoto, 2008) as central banks do, the opinions about the phenomenon are diverse, both in the belief that it may be a currency and in the discredit regarding its future. Thus, the analysis of the sources of institutional voids (Khanna & Palepu, 1997) can be a tool in obtaining answers on how these events manifest themselves.

As a recent product and with a future agenda of development and knowledge of the society, there is a greater opportunity for diffusion, technical knowledge, and research. Respondent R6 states that "the greater the integrity of information, the clearer it is for the bearer and even the regulatory systems on how to operationalize, how to structure operations. But it takes some time to happen." Respondent R10 goes further, unfolding the issue of information asymmetry in two ways: "the first in technical issues of usability and knowledge of the population, while projecting everyday situations of general use, drawing a parallel with the present currencies. The second point in the future is the uncertainty from the lack of information."

When addressing the number of opinions or debates about bitcoin, respondent R1 suggests that "[...] Different information that gives different opinions is essential for developing critical judgment, so that people have autonomy in decision making. And that's no different when we're dealing with a volatile currency like bitcoin." Not far from it, respondent R4 understands that, at this moment, people are starting "more serious, committed and responsible discussions. Because of this discussion format, they tend to be better." Not far from it, respondent R10 agrees that "the level of information asymmetry is decreasing," and so the technology behind it, in the case of the blockchain, tends to be demystified and to be bitcoin's big advantage.

Although the origin of bitcoin volatility (Bouri, Shahzad, & Roubaud, 2018; Dyhrberg et al., 2018; Pieters & Vivanco, 2017) is not the focus, it may generate information or misinformation that may impact the evolution as a currency. In this light, respondent R10 notes that "bitcoin has the potential to be this currency instrument, but it is serving a lot to be an instrument of speculation" caused by the high volatility. Respondent R4 agrees that it is an opportunity for "speculators and traders", and believes that "[...] as its use within retail and wholesale increases, so that the use for buying and selling of commodities as an effective means of payment also increases, volatility tends to decrease, although it is unlikely to be stable." Respondent R5, on the other hand, highlights the risk of loss using a payment method with such high volatility, although the cryptocurrency market is still small. Thus, bitcoin has served as an electronic medium of exchange and a more speculative investment (Dyhrberg et al., 2018) mainly for emerging country investors aiming to escape capital control, assure the anonymity and disregard the role of media in price formation by applying resources obtained in illegal activities (Bouri et al., 2018).

From the perspective proposed by Mair and Marti (2009) who note that where there are institutional voids there are market opportunities and economic imbalance (Mair & Marti, 2009; Mair et al., 2007; McCarthy & Puffer, 2016) it is evident that the need to obtain the best information for decision-making is a consequent condition of a phenomenon in the process of institutionalization (Tolbert & Zucker, 1998). This is more relevant when it is observed that bitcoin can become an economic and social mechanism that enables exchanges, as well as being a measure reference or even a store-of-value, which are a property of a currency (Hillbrecht, 1999; Yermack, 2015).

Nevertheless, there are issues of legitimacy, as the absence of a central governance structure has been considered a strength, but also a weakness (DiMaggio & Powell, 1983; Fry & Cheah, 2016).

Therefore, in the matter of information asymmetry, we have the following characteristics: need for reliable information for decision making; price asymmetry, volatility, acceptance; exchange rate versus bitcoin quotation; users with different information; quotation formation, usability, modus operandi, security. All of these categories connected to the importance of grounded concepts that can provide security to both bearers and users is an initial issue.

Based on these relationships, the following is proposed: *P1. Information asymmetry between the actors increases the bitcoin's volatility, resulting in difficulty to be institutionalized.*

3.2. Role of the Regulatory Institutions

Regulations convey trust and reduce uncertainty while limiting and imposing boundaries on the participation of stakeholders. Bitcoin is at a stage where, in general, there are no effective definitions regarding normative regulations, and consequently deserves an in-depth discussion and observation. In the original concepts of institutional voids, the proposal of Khanna and Palepu (1997) misguided regulations restrict the business development capabilities, although they may offer some form of stability to society. The result is that companies are less able to seize opportunities when compared to advanced economies.

The lack of (reliable) regulations expands the number of variables that causes uncertainty under the observed phenomenon, a condition that contributes to the theoretical concepts (Parmigiani & Rivera-Santos, 2015). In this approach that addresses rules and positioning, respondent R10 considers it "[...] a mistake if you fail to regulate in any way [...] because regulation can reduce uncertainty. If uncertainty is reduced, I reduce transaction costs. [...] It means that I have more efficiency in the economic transaction. So potentially more people will earn more without losing wealth through transaction costs." However, regarding the targeting under bitcoin, respondent R1 "[...] believes that the institutions will have to deal with bitcoin because it is already there. [...] bitcoin moves as money; this is a reality and people will hardly stop using it." In this sense, if the market as an institution has been a real place to make transactions, the technology has been cut from the links between producers, intermediaries, and buyers (Rainero et al., 2019).

One point beyond the scope of the regulatory authorities is the rules set out in the new currency issuance and transaction authorization programming code inserted into the bitcoin blockchain, especially settlement rules, new bitcoin's currency generation, and bitcoin issuance ceiling (21 million). Respondent R3 believes that "the good impact is that we avoid inflation. That's the good part because it's not a State that is printing currency, which we know is one of the causes of inflation." Respondent R5 goes beyond economic conditions, placing social factors in the discussion: "As we have trust that the plane will not crash... they are abstract systems of trust. Bitcoin generates this or not. This is a social construction. And the way companies build their reputation around it is crucial. [...] So, this idea that is an abstract thing in technology, is incoherent. Technology alone does not create a reputation. Those who create a reputation are people who identify with this technology. That's why you have a very intense movement around bitcoin all the time." The inelasticity of supply can be viewed as an advantage because it generates predictability of the quantity of money produced, thus avoiding inflation due to currency issuance (Dwyer, 2015).

The bitcoin ceiling has not yet been reached, leading to projections of a future based on previous experiences, such as the gold standard adopted until the second half of the twentieth century. Respondent R7 analyzes that "[...] having a currency limit is not challenging. In the old days, as paper money was issued, there was a certain limit, which was backed by the golden age. It was a physical limit to set that the amount of paper issued represented a certain value of that gold. That's how this whole process began." Considering the bitcoin limit, income elasticity can affect the intrinsic value of bitcoin (Dwyer, 2015).

The issues related to the limit of issued currencies reinforces the importance that mistaken regulations impact economically (Doh, Rodrigues, Saka-Helmhout, & Makhija, 2017). However, the theoretical perspective of institutional voids on this issue may be situational, while the issuance ceiling of new bitcoin currency units has not yet been reached (Nian & Chuen, 2015a; Oro Boff & Alves Ferreira, 2016).

Respondent R5 notes that "[...] Some theories of money put the state as absolutely central, in fact, without the state there would be no money. Bitcoin is revolutionary, [...] because it's like new gold. It is intrinsically limited and, in this sense, starts not only against the state but against the banks". And complemented by respondent R7: "When you think of economic expansion as a form of economic policy tool, you can no longer inject money into the economy. By controlling the issuance of currency, as it is already in the bitcoin algorithm, you lose an important tool in the economic management of the country." As there is no global regulatory framework because governments regulate or ignore bitcoins, it is a digital currency with no central issuing authority (Pieters & Vivanco, 2017).

Another central point concerns the identification of cryptocurrency holders, as the private key is traceable but not identifiable (Levin, O'Brien, & Zuberi, 2015; Nian & Chuen, 2015a). The implications of measures such as *Know Your Customer* (KYC) or *Anti-Money Laundering* (AML) (Pieters & Vivanco, 2017) may be weakened. Respondent R8 understands that "not having these mechanisms drives the user away a little. No one likes being outlawed, essentially." Respondent R3 projects "that at some point, States, governments will find mechanisms to try and identify everyone in their transactions." Nevertheless, bitcoin has filled a niche through a digital currency without any trusted parties or identified participants (Rainero et al., 2019).

In the same line of thought are the issues regarding bitcoin brokerage, since, in its liberal context, it can be transacted outside the financial reality, because, once the bearer already has the cryptocurrency, the movement occurs peer-to-peer (P2P). Financial intermediation, addressed here as bank financial transactions, generates transaction costs between those involved. Respondent R2 reminds that bitcoin "as a currency, is good, decreases costs, is perfect. You have the cost of the operation, the transaction is much smaller [...]. The middle agent is removed and more flexibility is given, as you don't have the transaction cost. In an action, there is custody, brokerage."

The assessment of the participation of financial institutions as part of the regulation category is important for the transaction cost conditions and the relevance of the institutions' position on the phenomenon. Efficiency reduction and uncertainty situations reinforce the theoretical perspective that variable and unpredictable rules and decisions make it difficult for companies to predict future market conditions or future regulatory conditions (Khanna & Palepu, 1997; Parmigiani & Rivera-Santos, 2015).

Therefore, there is the relevance about the bitcoin regulation, considering certain features: inefficient mechanisms may restrict product or service development; currency issuance and transaction regulations are transparent, formal or definitive; standard financial regulations may impact the bitcoin's market (non-use of KYC); low dependence on intermediary sources in the transactions; risks due to the lack of regulation. Regulations are abstract, impartial, and generalist normative acts that should provide economic and social stability. Almost all nations have their regulations based on their culture, financial system, and historical experience (Nicoletti, 2017).

We, therefore, venture the following proposition: *P2. Bitcoin regulation can reduce uncertainty and transaction costs, resulting in its institutionalization through the intensified use as a means of payment.*

3.3. Role of the Legal Systems

The legal aspects as a way to discipline social coexistence and establish rules of conduct for individuals within a society are complementary on the tripod of sources of institutional voids, information and regulations. Legal systems are also critical to the development of a market or product. When they are strong enough to enforce agreements, reliably and predictably, they increase trust and reduce uncertainty (Khanna & Palepu, 1997; Luiz &

Ruplal, 2013). Because bitcoin does not have a country as an issuer with the right of liability (Bollen, 2016) the respondents argue that there is a prior regulatory factor to be defined (Khanna & Palepu, 1997).

Bitcoin generally does not have a legal course, and this can have a stronger impact when emerging countries are analyzed, which in many cases are characterized by poor implementation of agreements. Respondent R10 states that "this pervasive perspective of bitcoin of not having a centralized regulatory body means that there is no point where a nationally verifiable system can be connected." And the respondent adds that "the essence of a reasonably organized legal system from the purely economic point of view is the low transaction cost, for the security of the transactions". This confirms the statement of Khanna and Palepu (1997) that markets depend on legal systems strong enough to enforce agreements reliably and predictably.

Given the lack of property rights, it is proposed to understand whether this influences bitcoin as a currency. The goal is not to understand what the legal nature embedded in this context is, but to identify the relevance in the bitcoin property rights in the interviewees' speech and how much this increases the levels of trust in the relationships. In this sense, respondents propose that the absence of property rights and even disagreements can occur with any type of payment and that bitcoin is another alternative for business relationships. Respondent R8 notes that "the least traceable or less identifiable transactions are paper transactions [...]. The problem is not in the bitcoin, but how the agreement is established. Money is just a means, it's just a mechanism."

In general, institutional voids are manifested so that they broadly agree with the theoretical perspective proposed by Khanna and Palepu (1997); Khanna and Palepu (2000) thus reinforcing the researchers' previous findings. However, when observing the legal aspects, it should be noted the need for efficient regulations that preceded the legal system. Legal systems are impacted to the detriment of situations that challenge the purview of nations due to the basic foundation of the means of payment: bitcoin does not have a country as an issuer with the right of liability (Bollen, 2016). It is characterized by the lack of an open identification of the carrier; developing markets and innovative products may be disassociated from the institutions; lack of formal written agreements to guarantee transactions or price quotation; protection of non-existent property rights; lack of a legal tender. These conditions, the exploration of institutional voids, the proposal to reduce uncertainty levels and the need for higher levels of legitimacy are steps in the path towards institutionalization. Tracey and Phillips (2011) suggest that the greater the institutional uncertainty, the greater the opportunity for actors to propose risk reduction.

Finally, the following proposition is ventured: *P3. Bitcoin institutionalization can be accelerated through a legal system that supports its transactions.*

4. CONCLUDING REMARKS

Bitcoin emerges as an alternative to the traditional currency. Our study analyzes bitcoin as an economic object through the logic of institutional voids. Thus, with the institutional perspective as a background and theoretical support, it is examined how the institutional voids are manifested (Khanna & Palepu, 2000) in the process of institutionalization (Tolbert & Zucker, 1998) of the bitcoin as a currency. This choice was relevant because bitcoin (and all cryptocurrencies) deals with disruptive payment system based on innovative features, resulting in difficulties to institutionalize the cryptocurrencies. From a theoretical perspective, bitcoin cannot be considered as currency, as it does not fulfill the three required functions: medium of exchange, unit of account and store of value, and resembles a speculative investment similar to what happened with the Internet in the 1990s (Yermack, 2015). However, bitcoin can be an alternative to the traditional currencies and payment systems (Dodd, 2017; Maurer et al., 2013). As it gains legitimacy, its process of institutionalization begins. By challenging the *status quo* (Karlström, 2014; Papadopoulos, 2015) other events may be triggered, such as taxation and tax collection, as well as the direct impact on the monopolistic model of state issuance of currency (Karlström, 2014). Cryptocurrencies represent an innovation that challenges the traditional business model of digital payments. Therefore, besides being a movement that generates uncertainties in the financial system, bitcoin is a social movement, which promises free and

decentralized money, absent from the traditional regulatory institutions, with social ties associated with liberalism. However, although bitcoin is a cryptocurrency without national borders, countries have adopted different attitudes towards money, showing that cryptocurrencies are context-dependent. Bitcoin as a currency is at an early stage in the institutionalization process. As currency may suffer new evolutions, and that bitcoin and other cryptocurrencies can be an alternative. When observing the original sources of institutional voids and emerging economies, this phenomenon is subject to effects similar to those of emerging economies. It is a recent phenomenon, in the process of institutionalization, with an innovative proposal, and that changes the way currency and states are related. Thus, the concept that failures cause imbalance is strengthened. The reliability of information is key to better decision making and is an entrepreneurial opportunity in an environment with institutional voids. There is a need and concern about the institutions' positioning to be effective in the regulations, to which bitcoin will hardly be immune. This reinforces the theory regarding efficient regulations for a condition of economic and social balance and stability.

In a public policy level, we bring some issues to the discussion. Firstly, the blockchain, with its multiple applications, makes an interesting provocation in the management and monitoring of transactions, and transforms exchanges into transparent, open, unchanging and traceable agreements. Second, the issues surrounding the role of the state as centralizing and holding the monopoly of money issuance. Even though financial institutions can create book-entry currency and use the currency multiplier effect, power and management are centralized in the state hands. Due to historical and power factors, the State can be against a currency that does not respect its institutional authority, which is contrary to the bitcoin proposal, which circulates freely on the Internet. Third, whether viewed as a crypto asset or as an asset for financial speculation, there is a wide field that can be discussed, such as earnings compared to risk-free rates, the investor profile and an entire income statement schedule. From an optimistic perspective, the range of price variation and speculation tends to decline as discussions increase, and it may reach some level of stability. This can also occur when the limit of bitcoins to be mined is nearing the end.

Regarding the legal aspects, notably, there is a need to strengthen the agreements in negotiations in general. Bitcoin is a means of payment contained in formal or informal agreements. Accordingly, it agrees with the theoretical perspective on the need for trust in the legal system for agreements, even if bitcoin does not guarantee the validity of these agreements. The observations suggest going beyond the theoretical proposal when there is an earlier issue, which is the definition of rules set by regulators so that the implementation of agreements is adequate. Bitcoin-related legal decisions need a prior regulatory definition to support decision-making and, consequently, legal decisions. As limitations, when addressing synchronism, it was not possible to observe which void is antecedent and which is posterior, or if all occur at the same time. Relevance issues between voids follow the same line of synchronism, varying according to each nation and environment. Other avenues of investigation propose an analysis of the use of bitcoin as a reference for a temporary sovereign currency for countries in economic and financial difficulties. Bitcoin's future projection is also an opportunity when the number of coins to be created runs out. Therefore, some historical comparisons can be made with the gold standard currency. Another possibility is to test the concepts of institutional voids for other innovative products, such as shared economy applications.

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