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"At the very beginning, there's this dream." The role of utopia in the workings of local and cryptocurrencies

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"AT THE VERY BEGINNING, THERE'S THIS DREAM."[1] THE ROLE OF UTOPIA IN THE WORKINGS OF LOCAL AND CRYPTOCURRENCIES

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ABSTRACT

Since the 2008 financial crisis, the number of alternative currencies aiming at transforming global financial institutions, such as local and complementary currencies (LCC) and cryptocurrencies, has exploded. Yet the motivations and workings of such monies are relatively unknown. This chapter aims to fill this gap by providing a framework that uncovers the ideals pursued by alternative currencies, and the effects of those ideals on the production of money. To do so, I present a comparative analysis of the valuation infrastructure – the processes through which value(s) is produced – of one LCC, *Sol Violette*, and three cryptocurrencies, *Bitcoin, Ğ1 "June"* and *impak Coin*. Throughout, I elaborate on the social meaning of money and the role played by alternative currencies in contemporary capitalism. I show that 1) despite targeting the same financial institutions, the utopia pursued by alternative currencies varies significantly and 2) this utopia is at least as important as the technology (e.g. blockchain) in shaping the workings of these monies. Based on these findings, I outline some implications for the social studies of financial technologies, their effects on our societies and their regulation.

Keywords: Alternative Currencies, Cryptocurrencies, Debt, Local and Complementary Currencies, Money, Social Relation, Utopia, Value(s)

[1] Source: https://www.impak.eco/en/our-mission/, accessed 18 December 2018. Full quote from the mission page of cryptocurrency impak Coin, "At the very beginning, there's this dream. Will you join us in making this dream come true?"

[2] I would like to thank all the founders and users of the alternative currencies who kindly opened the doors of their practices and utopia to my research. I am also very grateful to Delphine Gibassier who allowed me to use data on the local and complementary currency Sol Violette that she collected during an 18-month ethnographic study. I also thank my students, Michael King and Jean-Philippe Vergne for encouraging me to explore this fascinating (digital) world and sharing with me their knowledge on the topic. I also want to thank Paolo Aversa, Tima Bansal, and the participants of the 2019 Egos track "Dreams, Fictions and Calculations: Imagined Futures in Organizational Life" organized by Klaus Weber, Jens Beckert and Brooke Harrington, for their precious feedback on previous versions of the chapter. Last, I want to thank Raghavendra (Raghu) Rau and Robert Wardrop, co-Directors of the Cambridge Centre for Alternative Finance, Judge Business School for supporting this project and making it come true. The interpretation of findings, however, is my own and should not be ascribed to others. Note that this chapter is part of a larger project on the rise of financial technologies and their impacts on society.

INTRODUCTION

Although alternative currencies have long existed, the number of initiatives has exploded in the aftermath of the 2008 financial crisis. Alternative currencies, such as local and complementary currencies (LCCs) and cryptocurrencies, are currencies used as an alternative system of money to the one emitted and backed by nation-states, i.e. fiat currencies. Fiat currencies or "paper" currencies are government-issued legal tenders whose value is not dependent on any other asset (such as gold or other commodities). Fiat currencies include today's Canadian dollar, the euro or the British pound. In 2018, it was estimated that there were more than 2,700 cryptocurrencies[3] and 5,000 LCCs worldwide (Savoie, 2016)

Alternative currencies aim to transform global financial institutions by providing citizens with alternative monetary systems. Since the emergence of cryptocurrencies at the end of 2010s, their potential role in the capitalist system has been heavily scrutinized by governments and industries. Yet little is known about the goals and workings of such monies. This chapter aims to fill this gap by providing a framework that uncovers the ideals pursued by alternative currencies and the effects of those ideals on the production of money. Based on a comparative analysis of one LCC, *Sol Violette*, and three cryptocurrencies, *Bitcoin, Ğ1 "June", and impak Coin*, I show that despite targeting the same financial institutions, the utopia – or projects for society – pursued by alternative currencies can differ to a large extent. Uncovering these differences is essential if we want to understand the prevalence of this alternative movement and its potential consequences for our economies and societies. To do so, I analyze the valuation infrastructure of each currency under study in this chapter – i.e. the mechanisms through which value(s) is attributed to the exchanges mediated by the currency (Friedland & Arjaliès, Forthcoming; Helgesson & Muniesa, 2013). Throughout, I demonstrate that the utopia pursued by the currency matters as much as its technology (e.g. blockchain) in shaping the production of money. This finding implies that to understand the workings of a currency, the focus of analysis should not be only on the technology used to issue new tokens – as it is often the case, but also on the criteria on which this issuance is based. Based on these results, I outline some implications for the social studies of financial technologies, their effects on our societies and their regulation.

I conclude that (some) alternative currencies do form a coalition of the unlikely, but not as the result of a strange-bedfellows situation, in which individuals share common practices despite holding different views, but rather as the outcome of the opposite situation in

[3] https://www.investing.com/crypto/currencies, accessed 25 February 2020.

which individuals share similar views but follow different practices. While all alternative currencies certainly aim to escape current monetary systems, they should not necessarily be interpreted as a manifestation of a post-capitalist society – where capital would be shared by all citizens and value created through knowledge (Drucker, 1994), as it is often the case (Cohen, 2017). Many alternative currencies actually derive their value from the ability of a handful of capitalists to control the means of production… of money. As such, most alternative currencies are actually a perfect instantiation of what capitalism is, i.e. a system where private entities own the factors of production, including probably one of the most important factors in today's societies – capital itself.

WHAT IS MONEY?

The Three Functions of Money

Economists tend to identify money[4] through the roles it serves in society. Something can be considered as money if it acts as: a *media of exchange* with which to make payments; a *store of value* with which to transfer purchasing power (the ability to buy goods and services) from today to some future date; and a *unit of account* with which to measure the value of any particular item for sale. Different assets can play this role. For instance, Radford (1945) shows that cigarettes fulfilled these three functions for prisoners of war camps during the Second World War. Likewise, vouchers that represent a pre-payment for goods and services from a specific supplier (or group of suppliers) can be considered as money.[5] To function as a medium of exchange, there needs to be a system that enables transfers of value (i.e. a payment system). For any system other than the exchange of physical banknotes or coins, a means of recording the values stored (i.e. a ledger) is also required (McLeay, Radia, & Thomas, 2014).

What is Blockchain Technology?

Non-cryptographic currencies rely on a centralized double-entry ledger (i.e. balance sheet) to record the value of money exchanged between individuals. Cryptocurrencies rely on a specific type of ledger, that is referred to as "blockchain." Bitcoin is thus described as a

[4] Note that a currency is often considered to be the unit of measure associated with money. For the sake of simplicity, I will use both terms interchangeably in the rest of the chapter.
[5] However, their legal status generally differs from that of a banknote, since they do not usually legally entitle the holder to redeem the voucher.

digital ledger of monetary transactions in the form of a blockchain.[6] A transaction is a message such as, "I, Paul, sent five coins to Ana." To be validated, the message must respect three elements: 1) non-repudiation: Paul cannot later disavow it; 2) authentication: only Paul could have sent it, only Ana could have received it; and 3) immutability: the transaction cannot be altered later (Veneris, 2018). Blockchains aim to provide irrefutable proof that a set of transactions occurred between participants. They ensure that the three elements are respected using a peer-to-peer network that puts the transactions into a ledger certified in a decentralized manner. The ultimate purpose of the system is to avoid the problem of "double spending" when a given set of coins is spent in more than one transaction.

There are different types of blockchains. The blockchains used by business organizations are generally permissioned (between approved entities) and private. The one used by Bitcoin is an example of a permissionless (cryptographic approval) public blockchain. In the case of Bitcoin, transactions are grouped into blocks by miners, with these blocks forming hash-linked chains (i.e. the blockchain). Miners compete to randomly solve a cryptographic game to gain the right to create a new block. This puzzle is known as the "hash algorithm,"[7] a process through which transactions are validated and new transactions are arranged into a sequence and time-stamped. A blockchain entry is hence both a receipt and a transaction. Instead of two independent ledgers (i.e. double-entry bookkeeping), the entry is recorded on a public, distributed, interlocked, permanent and transparent ledger. The transactions recorded in the ledger accumulate over time, which means that it is almost impossible to edit past transactions. Indeed, to deconstruct the blocks, the approval or "proof of work" would have to be entirely re-executed for every block added after the edited one, which is computationally extremely demanding (estimated at more than 51% of the computer power of the system – a total that amounts to 1% of the world's energy consumption[8]). Bitcoin miners receive "block rewards" or "coinbase transactions" when solving the puzzle.

[6] The main innovation of Bitcoin was to combine the blockchain technology (which existed before 2008) with hashed digital signatures and timestamping in a peer-to-peer network.

[7] The SHA (Secure Hash Algorithm) is one of a number of cryptographic hash functions. A cryptographic hash is like a signature for a text or a data file. The SHA-256 algorithm generates an almost-unique, fixed-size 256-bit (32-byte) hash. A hash is a one-way function – it cannot be decrypted back. This makes it suitable for password validation, challenge hash authentication, anti-tamper, digital signatures.
Source: https://www.xorbin.com/tools/sha256-hash-calculator, accessed 25 February 2020.

[8] Written Testimony of Arvind Narayanan, Associate Professor of Computer Science, Princeton University United States Senate, Committee on Energy and Natural Resources Hearing on Energy Efficiency of Blockchain and Similar Technologies, 21 August 2018
Source: https://www.energy.senate.gov/public/index.cfm/files/serve?File_id=8A1CECD1-157C-45D4-A1AB-B894E913737D, accessed 17 December 2018.

Note that most cryptocurrencies now use "proof of stake" where the creator of the next block is chosen via various combinations of random selection and wealth or age (i.e. the stake).

Money as Debt

Money is essential to the economy, but its nature has varied substantially over time. Despite the broad use of fiat currencies in contemporary capitalism, individuals still often believe that the value of the money they use is based on the reserves of precious metal hold by central banks – akin to commodity money. Due to this popular belief, today's mechanisms of creation of money are often misunderstood. The Bank of England (2014: 1) laments, "Money creation in practice differs from some popular misconceptions – banks do not act simply as intermediaries, lending out deposits that savers place with them, and nor do they 'multiply up' central bank money to create new loans and deposits."

The reality is that currencies issued by central banks only account for a very small amount of the money held by people and organizations (e.g. an estimated 3% for the United Kingdom (McLeay et al., 2014)). Most money in circulation (97%) actually consists of deposits with commercial banks, which are produced by banks themselves. These deposits are created when banks lend money to individuals, i.e. through debt. When a bank makes a loan, for instance by granting a mortgage to buy a house, the bank does not actually have the equivalent money in currency or even a proportion of the amount in its reserves. Instead, the bank credits the customer's bank account with a deposit the size of the mortgage. As such, the recording of the deposit is the very moment of production of money. Conversely, repaying bank loans destroys money, just as making loans creates it.

Central banks shape commercial banks' ability to lend money, either directly through the loan rates they charge the commercial banks or indirectly through the way their monetary policy affects economic activity. Such decisions influence the commercial banks' overall confidence in the ability of economic actors to reimburse loans, in other words, their ability to acquire economic value (e.g. through an increase in real estate values or through salaries) and the resulting capacity to create money. These decisions are reflected in the interest rate (plus any fees) charged by the bank, which dictates the amount that households and companies want to borrow, constraining in practice the amount of new money created. Thus, contrary to what individuals usually believe, the quantity of money that a commercial bank can create does not depend on the amount of reserves the commercial bank owns at the central bank, but on its confidence in the future economic well-being of its clients.

Commercial banks are the mechanism through which debts are centralized and cleared, meaning that government money is not more important than bank money (Dodd, 2016: 105). Currencies (banknotes and coins) are therefore better described as "debt" or "promises to pay" from the central bank to consumers and "bank deposit promises" from commercial banks to consumers. Bank deposits are in fact a record of how much a bank owes its customers. For the Bank of England, money is then "just a special form of IOU [I owe you], or in the language of economic accounts, a financial asset. […] Financial assets are simply claims on someone else in the economy – an IOU to a person, company, bank or government." (McLeay et al., 2014: 1) What makes money special, according to the Bank of England, is that it is an IOU that everyone in the economy trusts and therefore accepts as a universal medium of exchange. As Dodd (2016: 134) summarizes, "Debt is no longer facilitating capitalism. It is driving it."

Money as Social Relation

Considering money as an acknowledgment of debt has become the mainstream view in monetary theory (Dodd, 2016: 93). Most sociologists of money complement this view by arguing that money is also a "social relation" (Ingham, 1996, 2013), whose value depends less on it being underpinned by a commodity than on users trusting the system on which its issuance is based. Dodd (2016: 393) hence suggests shifting from a view of money as a "thing" with a "stable meaning and functions" to a "process that is inextricably social, inherently dynamic, and complex." Zelizer (1989) was one of the first researchers to demonstrate that "a dollar is a dollar is not a dollar." She showed that the money making up household income in the late 19th and early 20th centuries was differentiated according to both gender and class differences. She named this process "relational earmarking" or the mechanism through which "people create, maintain, negotiate, or sometimes dissolve their social-economic relations by searching for appropriate matches among distinctive categories of social ties, economic transactions and media of exchange (Bandelj, 2016; Zelizer, 2012)" (Bandelj, Wherry, & Zelizer, 2017: 6). In other words, people associate each type of money with particular social and economic exchanges (for example, an individual expects to bring a bottle of wine rather than cash when invited to dinner) and, as I will show below, utopia. Money is thus transformed into an "object of desire" (Yuran, 2014) not only for what it can bring individually but also collectively. With this in mind, sociologists of money interpret the creation of alternative currencies as a means of resisting a nation-state, whose sovereign

privilege includes selecting the system of tokens it is willing to accept as payment of taxes (Cohen, 2004; Knapp, 1924).

The relational properties of money "enrich money from the inside through the social relations it makes possible" (Dodd, 2017: 240). This enrichment unfolds through the interactions between individuals, where people investigate and make decisions based on their own fictional expectations (Beckert, 2016: 14). The relational work involved in an alternative currency is intrinsically linked to the valuation infrastructure attached to the currency. The valuation infrastructure of the currency dictates how and what is deemed worthy of value, and comprises four dimensions (Friedland & Arjaliès, Forthcoming): 1) institution: how the chosen value(s) are set up as ideals to pursue; 2) production: the mechanisms for producing such value(s); 3) territorialization: the selection of objects, practices or beings to which value(s) can be attached; and 4) evaluation: the evaluation schemes used to assess the production of (future) value(s). Value in this context is not limited to financial value and can include elements that individuals judge to be important in life, such as humanity, friendship and pleasure. Like sociologists of money, sociologists of valuation suggest focusing on valuation as an action, rather than values as things (Hutter, Stark, & Berthoin Antal, 2015; Muniesa, 2011). Valuation is "itself a relational, active process out of which something can hold as the sign (read 'the value') of something." (Muniesa, 2011: 32)

Despite the essential aspect of valuation in the constitution of monies, the valuation process of money per se has attracted little interest. According to Ingham (1998), social theorists have tended to "sociologize" (p.14) money with the result that most research has focused on the generation of "trust" and the social and political dimensions of monies at the expense of what money is intrinsically used for, i.e. to value. The author comments, "the approach should be balanced by a recovery of some responsibility for what are seen as 'economic' problems, such as inflation, the supply of credit, the determination of interest rates and so on" (Ingham, 1998: 14). Central to the issues evoked by Ingham (1998: 14) is "the conception of the 'real' economy and its equally deficient anachronistic commodity theory of money." This problem is of primary importance for monies like LCCs or cryptocurrencies such as impak Coin (see below) whose goal is to avoid "speculative value" (Davis, 2018). Despite the increasing numbers of alternative currencies, the workings of such valuation processes are therefore relatively unknown. Understanding how these monies function could not only augment our knowledge of alternative currencies, but also contribute to the understanding of why the existing monetary system is repeatedly called into question.

WHAT ARE ALTERNATIVE CURRENCIES?

A Brief History of Alternative Currencies

During the Bretton Woods system (1944-1971), most of the allied nations' currencies (e.g. United States, Canada, Western Europe, Australia and Japan) were underpinned by gold, and were therefore known as "commodity money."[9] The United States actually used a gold standard for most of the late 19th and early 20th centuries, prior to Bretton Woods. Unlike commodity money, the fiat money used today has no commodity-linked "intrinsic value." It derives its value from currency users' trust in the government issuing the currency. Nonetheless, before the late 19th century and the expansion of the British monetary system model in the world (Knapp, 1924), common national systems were the exception, with local currencies being the norm. Common currencies at that time were mainly used to compare and exchange local currencies. For instance, British colonies issued bills of credit with a predefined exchange rate with the pound sterling. These "colony currencies" existed from the end of the 17th century through to the late 18th century (Peacock, 2014). For many centuries, European local lords could mint coins for exchange on their territories. Like the national commodity monies, the value of currency exchanges was most often dictated by the amount of precious metal (e.g. gold or silver) contained in each coin.

After the 19th century, however, most local currencies disappeared as a result of the rise of national and international monetary systems (Blanc, 2006), only resurfacing from time to time, during economic crises or wars. For instance, during the Panic of 1907, the largest financial crisis in the US before the Federal Reserve was established in 1914, 145 US cities issued currency substitutes to the public to help their banks overcome the crisis (Yue, 2015). What distinguishes today's western LCCs[10] from their predecessors is the content of their utopia (Zelizer, 2004). Previous LCCs were often used as a temporary solution for monetary systems whose currency value was undermined. Today's western LCCs are mainly developed to fight the impersonal aspect of economic exchanges and inequalities embodied by fiat currencies. According to their proponents, LCCs could help build a better society by restoring rather than eroding human ties.

[9] National currencies could be converted into US dollars, which were underpinned by gold reserves – the United States controlling two thirds of global gold reserves.

[10] LCCs are used in some emerging countries due to the lack of a functioning national monetary system. This chapter only focuses on western LCCs projects.

Cryptocurrencies are a much more recent phenomenon. The first one, Bitcoin, was launched in 2009. A cryptocurrency is a digital currency transacted securely, transparently and peer-to-peer by means of cryptography (Hsieh, 2018: 1). The launch of cryptocurrencies was motivated by a desire to eliminate the inefficiencies of the intermediated banking system that had prevailed so far in most capitalist societies. Such intermediated models rely on the ability of central banks[11] and commercial banks to mediate the relationship between the supply and demand for money, either directly – through the issuance of coins and bills, or indirectly – through interest rates (see above).

The rest of the chapter focuses exclusively on contemporary western LCCs and cryptocurrencies. These monies, however, are not the only types of alternative currencies existing today. "Community currencies," with which LCCs are often associated, also comprise Local Exchange and Trading Schemes (LETS) that rely on barter and time-based money whose currency unit is time. LETS are usually not-for-profit organizations that aspire to alleviate poverty and social exclusion. The first LETS was created in Canada in 1983 to enable individuals to exchange goods and services in a situation where money was in short supply due to a local economic crisis. Time-based currencies involve valuing in time credits the hours spent on voluntary activities within a community (e.g. providing transportation or assisting an elderly person) (Meyer & Hudon, 2017: 634). The Time Dollar currency (a time-based currency) was created in 1986 in marginalized areas of the United States to help rebuild social ties. Overall, community currencies aim to transform the nature of exchanges by promoting solidarity, cooperation and the development of sustainable development. They are therefore considered as local modes of resistance to the capitalist system and vehicles of social change.

The Utopia of (Alternative) Currencies

Since alternative currencies seek to offer imaginary alternative monetary systems for the societies in which they operate, they have also been described as "utopian monies" (Dodd, 2016, 2017). Utopia refers to an imagined community or society that possesses nearly perfect qualities for its citizens. Utopia literally means a place "*topos*" that does not "*ou*" exist. Utopianism has often been associated with the abolition of money – a "dirty object" that organizations wanting to provide an alternative to capitalism usually seek to avoid (Farias,

11 The first central bank, the Bank of Amsterdam, was founded in 1609 in the Dutch Republic. A central bank's mission is to promote the good of the people of its nation by maintaining monetary and financial stability.

2017). Sociologists of money instead argue that utopianism is actually implicit in all monies; each monetary system embodying an idealistic social project (Dodd, 2016). Beckert (2016) further contends that any economic endeavor comprises "fictional expectations" that are essential to the workings of the capitalist system. Fictionality is the "inhabitation in the mind of an imagined future state of the world and the beliefs in causal mechanisms leading to this future state." (Beckert, 2013: 219) Arjaliès and Durand (2019) thus show that each financial product is actually anchored in specific "morals" that dictate and shape market and human behaviors.

Utopia has always accompanied capitalism and its monetary system. After the French Revolution of 1848, Proudhon's *Solution of the Social Problem* (Proudhon, 1849) set out his project for two banks, a Bank of Exchange and a Bank of the People, which would give power to workers instead of financiers. Proudhon aimed to transform money into a medium of exchange rather than a means of amassing capital. He wrote, "Utopia needs for its realization capital accumulated, credit opened, circulation established and a prosperous state" (Proudhon, 1849: 45 cited by Dodd (2017: 235)). The euro followed another utopia. Although the currency is now criticized for its lack of political and social vision, it was originally conceived as a way to help maintain peace and create cohesion in a region that had been bruised by war and occupation for years (Feldstein, 1998; Kaelberer, 2007). The euro envisioned a Europe that would stand together for better or for worse.

The aim of today's LCCs is inherently "relational" (Zelizer, 2012) in the sense that their ultimate purpose is to reconnect human beings to each other and to their territory. Money is not perceived as a thing, whose face value would derive from its intrinsic qualities (such as gold) but as a process, whose value comes from the mutual engagement of currency members. Such utopia is not the one shared by most cryptocurrencies whose members in contrast praise the non-specificity of money (Simmel, 1904). Cryptocurrencies like Bitcoin indeed enable its members to not depend on anyone in particular, which means that no one has power over anyone. This non-specificity transforms money into a foundation for individual freedom.[12]

[12] I am grateful to Jean-Philippe Vergne for raising the difference between non-specificity and anonymity. Cryptocurrencies' members like Bitcoiners praise their freedom to exchange with whom they want (i.e. without the need to rely on existing financial institutions), but do not necessarily do it anonymously. There are in fact many social relations in most cryptocurrencies' communities.

The Four Alternative Currencies under Study

The following sections compare the utopia and valuation infrastructure (Friedland & Arjaliès, Forthcoming) of four different types of alternative currencies – one local and complementary currency, *Sol Violette*, and three cryptocurrencies, *Bitcoin*, *Ğ1 "June"* and *impak Coin* (cf. Figure 1 as overview).

Sol Violette (SV). SV was initiated in the city of Toulouse, in South West France, at the end of 2009 and officially launched in May 2011. This LCC was named the "Sol Violette," after the violet, an emblem of the city. SV is a not-for-profit association that was founded with the monetary help of organizations from the social economy sector. The individual members (consumers) of the SV are called "Solistes" while the organizational members (producers and service providers) are named "Prestataires" (member organizations). In 2018, the LCC comprised 6 employees, 2,400 members (Solistes) and 270 member organizations.[13] In 2015, a total of 172,546 SVs[14] (equivalent in euros) had been exchanged and the "*Produit Intérieur Doux*" (PID), or Soft Domestic Product, generated was 287,130 euros. The permanent team is responsible for managing the community of member organizations and Solistes. Their activities include educating through events, diffusing the model by recruiting new members and building relationships with local institutions and other LCCs. The Sol Violette is considered by other European LCCs as a model for LCCs. The fact that it has been able to survive and maintain its democratic vision for over eight years is considered as evidence of its success.

Bitcoin. Bitcoin is probably the best-known cryptocurrency in the world. The Bitcoin white paper (Nakamoto, 2008), which describes its functioning, was published in 2008 by Satoshi Nakamoto, a pseudonym for the lead (team of) developer(s). One of the key motivations for creating Bitcoin was to remove financial intermediaries, e.g. banks that charge fees to transfer money between countries or a government-influenced central bank that uses taxpayer's money to bail out bankrupt private banks. In the aftermath of the 2008 financial crisis, the founder(s) of Bitcoin hoped to create a disintermediated peer-to-peer system based on blockchain technology that would put the financial system back into the hands of individuals, instead of financial institutions. In the nine years following its creation, Bitcoin's market capitalization increased from zero to US$300 billion (maximum), with a

[13] https://www.sol-violette.fr/indicateur/lister, accessed 15 January 2019.
[14] As a matter of comparison, this amount is what Bitcoin processes each second.

total of 18,237,250 Bitcoins in circulation in 2020.[15] Bitcoin has benefited from a high degree of (social) media interest. Its analysis by social scientists, however, has remained scarce, particularly from a sociology of money viewpoint, with some notable exceptions (see Bjerg, 2016; Dodd, 2018; Maurer, Nelms, & Swartz, 2013; Swartz, 2018; Vergne & Swain, 2017; Vidan & Lehdonvirta, 2019).

Ğ1 "June." Ğ1 (pronounced "June") is a "free" crypto-currency launched in France in 2017. Free means that its issuance is neither based on any goods nor on any production, but co-issued by all individuals alive in a community.[16] This cryptocurrency aims to combine the human connection sought by the LCCs and the use of blockchain technology to produce money. The project is gaining momentum, but remains small in terms of members (4,345)[17] and volume exchanged.

Impak Coin. Impak Coin (MPK) is a combination of an LCC and a cryptocurrency. Launched in Canada in 2016 and currently in its beta version, it uses a private blockchain technology whose production of money is generated by transactions conducted in "impact" organizations that are members of the impak ecosystem. The goal of impak Coin is to recouple the value of money with the "impact economy," thereby contributing to the creation of a stable financial system at the service of a sustainable real economy. The company explains, "The impak Coin (MPK) merges the benefits and functionality of complementary currencies, rewards programs and new decentralized virtual currencies. The aim of the MPK is to encourage and reward the use of money into the impact economy – a "real" economy composed of businesses that generates social and environmental positive impact." (source: interview)

Note that the four currencies differ to a large extent, in terms of types of organizations, scale, level of development and usage. I selected them since they embody different utopias while using, for some of them, the same type of technology. The sections are meant to be read in order, as the analysis of each currency builds on the previous one(s). With the exception of Bitcoin, whose founder(s) is/are anonymous, the founders and some users of all the currencies under study were interviewed for the purposes of this research (2017-2019). I also interviewed individuals who identified themselves as Bitcoiners, i.e. members of the Bitcoin community. These interviews enabled me to gather more information on the workings of each currency and better understand the motivations and ideals pursued by their founders and

15 https://coinmarketcap.com/currencies/bitcoin/#charts, accessed 25 February 2020.
16 https://bravenewcoin.com/insights/how-blockchain-is-reshaping-our-economic-environmental-and-social-orders-ptIII, accessed 10 January 2019.
17 https://duniter.fr/g1/#/app/wot/map?c=46.6042:3.6475:6, accessed 25 February 2020

members. The analysis of Sol Violette also benefited from input obtained through an 18-month participative observation conducted by Delphine Gibassier as part of an ethnographic study.[18] The descriptions below are based on my own interpretation of the interviews, observations and documentary evidence gathered on each currency. They should be ascribed neither to the interviewees nor to the organizations involved in each currency. Note that I have never possessed any of those currencies nor been involved in the organizations attached to the latter. The descriptions are schematic at best and focus exclusively on the utopia and valuation infrastructure of the monies.

[18] Data currently being analyzed with Delphine Gibassier and Tima Bansal.

Table 1: The Valuation Infrastructure of Sol Violette, Bitcoin, Ğ1 "June" and Impak Coin

Alternative currency	**Institution: Values pursued**	**Production: Creation of values**	**Territorialization: Selection of objects, practices, beings to which values are attached**	**Evaluation: Schemes through which (future) produced values are assessed**
Sol Violette	Encouraging local and humanized exchanges on a territory.	- Pledging - Melting - Paper banknotes - Ethical merchants	- Specific territory - Members sharing common values - Specific goods and services	- Use of currency - Soft domestic product - Education of citizens - Ongoing resistance
Bitcoin	Disintermediating financial exchanges to re-empower individuals.	- Mining using blockchain technology - Machine and social consensus	- Not tied to a physical place - Anyone, any good and any service - Exclusive governance structure	- Use of currency - Financial value – compared to other currencies
Ğ1 "June"	Valuing human beings for what they are, i.e. human beings, and not as productive forces of capitalism.	- Creation of Universal Dividend using blockchain technology - Web of Trust	- Ad-hoc physical place - Living human beings who know each other - Any good, any service	- Use of currency - Education of citizens - Ongoing resistance
Impak Coin	Encouraging the development of an impact economy.	- Creation of rewards using blockchain technology - Impak ecosystem	- Members sharing common values - Specific goods and services - No "physical" place but a (virtual) marketplace	- Use of currency - Transactions in the impact economy - Education of citizens

USING LOCAL AND COMPLEMENTARY CURRENCIES TO VALUE LOCAL AND HUMANIZED EXCHANGES: THE EXAMPLE OF THE "SOL VIOLETTE"

Institution of value(s)

The Sol Violette (SV) was created "to encourage actors of the economy to produce and consume locally with respect for humans and nature, placing citizens at the heart of the project" (2011 SV Experimentation Report). SV members notably believe that their local currency could help address the "global crisis" that followed the 2008 financial crisis. In 2017, 84% of Solistes stated, "I adhere for ideological reasons, out of the conviction that finance is rotting society" (Internal Questionnaire, 2017). Their collective enemy is the "financialized economy" and its associated "speculation." SV members want to put finance "at the service of the real economy" (2012 SV Report). They lament that most of today's money is issued and managed in a private and competitive framework, through financial and banking institutions. According to SV members, the privatization of finance has led to our society being dominated by profit maximization. They explain that "Money is a public good, a necessity for all, but it is managed as any other private good, such as when individuals need to pay interest to obtain money." (2014 SV Report) In 2017, the SV disclosed its "wheel of values," values that need to be pursued through the use of the currency. The wheel comprises eight values: relationships, life, proximity, democracy, ethics, citizenship, trust and solidarity.

Production of value(s)

The SV relies on a sophisticated and ambitious valuation infrastructure that comprises many different aspects. We describe the main mechanisms below.

Pledging. The principle of pledging (*nantissement*) is the first pillar of the SV's operations. It involves going to one of the two partner banks to exchange euros for SVs, thereby taking money out of the traditional and speculative spheres of the economy and placing it in the "real economy." Pledging money is described as an act of "*nantissement*" ("*nantis*" means "well-off" and "pledging a collateral as guarantee for a debt contract") that "reorients money towards the productive sphere at the expense of the speculative circuits." (2011 SV Experimentation Report) SV members explain that "What is at stake is the re-localization of monetary exchanges, 98% of which are currently conducted on financial markets" (2013 SV

Report) To incentivize members to pledge euros, the SV increases the value of each euro exchanged by 5%, meaning that 1 euro equals 1.05 SVs. The goal is to convert as many euros as possible into SVs.

Melting. The second pillar of the SV valuation infrastructure is melting (*la fonte*). Melting is a principle that causes a currency to lose value if it is not in circulation, e.g. a loss of 5% after three months of non-circulation. Melting is intended to increase the currency's speed of circulation. According to SV members, "wealth is not created when money is accumulated but when it circulates" (January 2010, citizens' meeting). By limiting hoarding, the SV hopes to multiply the speed of circulation of the SV by five, compared to the euro. According to SV members, this speed of circulation would create "five times more wealth while respecting humankind and nature."

Paper banknotes. To encourage members to increase their use of SVs, the SV team debated switching to a digital version of SVs. SV members, however, believed that a "real economy" needs "real money" and therefore physical paper banknotes should not be abandoned. Paper banknotes are an "expression tool" that often triggers questions from non-members (2014 SV Report).

Selecting ethical merchants. To become an SV member organization, it is not enough to be a local economic actor. Organizations must either belong to the social and solidarity economic sector or prove their willingness to engage socially and environmentally for the benefit of the territory (assessed through a questionnaire). The SV's permanent team aims to guarantee that merchants' values are aligned with those of the currency and the political project it pursues (i.e. fighting the financialized economy). Each SV bank note states "Transform your money into a ballot!"

Empowering citizens. The LCC aims to transform citizens into "money experts" so they could introduce money into their daily conversations without being overwhelmed or questioned. To achieve such an outcome, the SV team aims to transform the LCC into a tool of "popular education." With this in mind, the team organizes open information meetings in different locations across the region with the hope to reach as many people as possible. These debates between (potential) members are essential for the LCC to fulfil its educational function. It is through these debates that individuals can reflect on and learn about the role of money in

society. It is also a way for members to "feel responsible and own the project" (2011 SV Experimentation Report). The SV team also creates communication tools, such as pedagogical booklets that explain the benefits and workings of the SV, to transform what they judge to be a complex project into "something accessible." Money for SV members is therefore described as a political act.

> In order to put money back on the political agenda, it is absolutely essential that citizens take ownership of it [money]. They need to be interested in how it works and in its many dysfunctions. It is at this moment that a local currency becomes a unifying educational tool. (SV 2013 Review)

Evaluation of Value(s)

Evaluation of SV stock (le stock). SV members use two main indicators to evaluate SV circulation. The first indicator involves assessing the "stock" of SVs in each member organization. The probability of exchanges taking place in SVs is directly linked to the diversity and abundance of SV supply and demand. The project's main difficulty is to achieve a level that ensures fluid exchanges.

Evaluation of SV leakage (la fuite). The second indicator used by SV members to assess the circulation of SVs is the absolute number of SVs converted back into euros. If member organizations or Solistes convert SVs back into euros, this means they have not been able to spend that amount in the SV circuit. SV members tend to avoid converting SVs because 5% of the face value is retained by the SV (100 SVs become 95 euros) that reinvests it into some community projects.

Measuring the Soft Domestic Product (Produit Intérieur Doux - PID). The SV is expected to create wealth: employment, ethical values, respect for humans and products. To assess the wealth creation generated by the LCC, SV members attempt to measure the PID "*Produit Intérieur Doux*" (Soft Domestic Product). The PID is defined as "the production sold that is respectful of humans and nature." (2011 SV Experimentation Report) The PID is meant to replace the PIB (*Produit Interieur Brut* or Gross Domestic Product). Transactions in SVs correspond to virtuous exchanges and contribute to the growth of the PID.

Territorialization of Value(s)

The SV is a local and complementary currency to the euro. It is local because the currency's working principles promote local shops, short distribution channels and new forms of entrepreneurship orientated towards the sustainable development of the Toulouse region and its surrounding areas. The territory where the SV is used has increased continually since its launch. In 2012, SV members agreed that SVs could be used within a 100 km radius of Toulouse, provided that the suppliers furthest from the city maintained strong economic relations with Toulouse in order to guarantee the smooth movement of the currency (2012 SV Report). In 2011, to increase the circulation of SVs, the SV team began trying to extend the use of SVs to public services. The SV team worked with France's central bank, the *Banque de France*, to attempt to allow payment of local services and taxes in SVs. However, until the 2014 French Law on the Social and Solidarity Economy, no public institution was ready to allow payment in LCCs. Another problem evoked by SV members is the lack of proximity merchants, cultural services and craft services in the network. The density of the distribution channel is judged to be too "weak" in many districts of Toulouse. SV members find it extremely demanding to physically travel to member organizations.

Despite their efforts, the SV team therefore finds it difficult to mobilize people within the network. Both Solistes and member organizations judge the daily use of SVs to be difficult and unnatural. The SV team explains that "it requires a lot of time and constant efforts to extend and mobilize new member organizations" (2012 SV Report). Individuals initially find it hard to understand how the LCC functions. When they finally grasp the workings of the project and decide to become members, they struggle with the subtleties of the valuation infrastructure. Employees of member organizations find it particularly hard to use two currencies. Additionally, not all employees support the SV, which raises issues within member organizations. Sometimes they do not want to communicate on the project or to receive salaries paid in SVs. To address this issue, the SV offers member organizations specific accounting support when they first join the network and continuous education and training are needed to maintain the dynamism of the network. Yet proponents of the SV continue to praise the benefits of the LCC, which maintains some pressure on the financial system by acting as "a thorn in its side."

USING A CRYPTOCURRENCY TO VALUE SCARCITY AND EXCLUSIVITY: THE EXAMPLE OF BITCOIN

Institution of Value(s)

Bitcoin is often described by popular media as a fashionable, risky and speculative asset whose value is based on irrational beliefs. Yet the utopia that gave birth to the publication of the Bitcoin white paper in 2008, by anonymous Satoshi Nakamoto (2008), was quite different from the extreme form of capitalism that Bitcoin now embodies. Bitcoin was actually created in the aftermath of the 2008 financial crisis in order to remove the financial institutions from the monetary system to (re)empower citizens. It aimed to achieve this ideal by using blockchain technology and its peer-to-peer disintermediated system. In doing so, Bitcoin solved three key problems: 1) banks' central authority to validate transactions; 2) the fees incurred and the length of such a validation process and 3) the lack of anonymity of the actors implied in these exchanges.

Bitcoin actually allows users to transfer money, notably across borders, at a fraction of the cost and much faster than international wire transfers that use international settlement services such as SWIFT (e.g. Bitcoin fees estimated at less than 1% compared to 9% for Western Union (Wang & Vergne, 2017: 2)). The currency also provides users with pseudo-anonymity (only the user's digital wallet is traceable) and the three functions of money (see above) without any central authority. For all these reasons, Bitcoin has often been described as the product of anarchists and techno-utopians animated by their desire to suppress dominant social institutions by autonomous machines (Dodd, 2018; Maurer et al., 2013; Swartz, 2018; Vidan & Lehdonvirta, 2019). The reality is probably much more complex. Today's Bitcoin users are incredibly varied; some of them actually belong to the financial institutions that were first targeted by the cryptocurrency. Many individuals involved in the launch of Bitcoin from 2009 to 2011 for instance started other cryptocurrencies.[19] While the utopia was quite clear when first created, today Bitcoin's ideals are certainly diverse.

[19] By January 2019 and since the creation of the cryptocurrency, Bitcoin developers and network developers have "forked" the code, starting a new cryptocurrency, more than 70 times. The most successful fork to date is Bitcoin cash.

Production of Value(s)

A key factor that needs to be understood in the functioning of cryptocurrencies is the mechanism through which new tokens are actually produced. What matters is not the blockchain per se, which is after all only a digital ledger, but the assumptions on which the blockchain is built. In the case of Bitcoin, new (fractions of) tokens are issued each time a miner successfully validates a transaction. These new tokens provide miners with financial incentives to conduct the "proof-of-work," which is a fundamentally costly and random process. This "competitive bookkeeping" is called "mining" in reference to gold mining[20]. The miners all compete to solve a cryptographic puzzle, and the winner is logically the one (e.g. individual or data centre) with the most computing power. To get their transactions mined first, Bitcoin's users also include Bitcoin rewards in their transactions, with miners picking the transactions with the biggest incentives. The whole idea of Bitcoin is that as time unfolds, the cryptographic puzzle or "hash algorithm" will be more difficult to solve. It means that each mining operation will be costlier, which will eventually lead to fewer miners. The overall number of Bitcoins is indeed expected not to exceed 21 million. Akin to a gold-based currency, the value of Bitcoin is therefore based on Bitcoin users' belief that the number of tokens will never exceed this fixed amount, with the digital scarcity created through blockchain replacing the scarcity of precious metals (Dodd, 2018: 37).

While the blockchain technology ensures a transparent[21], peer-to-peer and disintermediated system, the governance of the blockchain ensures that the coordination is collective and the result of community decisions. To be validated, all proposed protocol changes in the code supporting the blockchain must be supported by 51% of the computing power held by miners. This coordination mechanism is obtained through changes made in the Bitcoin Improvement Proposal (BIP)[22], a design document providing information to the Bitcoin community, or describing a new feature for Bitcoin or its processes or environment. These choices rely on online and offline discussions. According to Hsieh and Vergne (2018), Bitcoin is actually one of the first "Decentralized Autonomous Organization" (DAO), i.e. "non-hierarchical organizations that perform and record routine tasks on a distributed,

[20] There is however an important difference with gold mining. When the price of gold goes up, miners can adjust the supply upward to make it go down and vice-versa. Bitcoin has a fixed supply. No matter what the price of mining is, 12.5 new bitcoin will be issued in the next ten minutes.

[21] For instance, all miners can be identified using the blockchain's record of IP addresses. Some share their resources to form "mining pools." Who is "behind" the IP addresses, however, remains unknown. See https://www.blockchain.com/en/pools.

[22] https://github.com/bitcoin/bips, accessed 15 January 2019.

cryptographically secured, public ledger; and that rely on the voluntary contributions of their internal stakeholders to operate, manage and evolve the organization through a democratic consultation process." (Hsieh, 2018: 1) According to the authors, DAOs coordinate tasks through a decentralized "machine consensus" (i.e. blockchain) that integrates a "social consensus" through a new class of paid stakeholders, namely, network validators (ibid., p.95). As we will see below, however, the democratic aspect of the system is questionable, as only the few individuals able to understand the complex workings of the currency can be involved in its governance.

Evaluation of Value(s)

In 2017, it was estimated that 450 developers contributed regularly to the code, that 200,000 transactions worth on average $3,500 were processed every day, and that more than 11 million user accounts, known as "Bitcoin wallets," existed (Hsieh, 2018: 17). Bitcoin is therefore used as a system of payment. It is not yet used broadly as a unit of account, since many organizations still refuse to authorize the inclusion of cryptocurrencies in their balance sheet. Bitcoin is nevertheless by far the largest cryptocurrency in terms of market capitalization. Interestingly, however, this value is not given in Bitcoins, but in US dollars. The ability to exchange Bitcoins for a fiat currency, and other cryptocurrencies, is actually essential to the valuation of the currency. The mechanisms of this valuation are unclear. Some researchers argue that the financial value of cryptocurrencies results from a mechanism of supply and demand, notably nurtured by (social) media effects, while others instead suggest that such value is intrinsic and depends on the technological innovation supporting the currency. According to Wang and Vergne (2017), for instance, cryptocurrencies do not behave like traditional currencies and do not follow the Quantity Theory of Money (Fisher, 1911), according to which an increased supply should, ceteris paribus, lead to lower prices – and lower returns (Wang & Vergne, 2017: 2). What is clear, however, is that the "trust" of Bitcoin users in the valuation infrastructure supporting the workings of the cryptocurrency, i.e. machine and social consensus, and to a certain extent in the fiat currencies to which their value is attached – hence the very financial system it aims to fight – are essential to its workings.

Territorialization of Value(s)

Bitcoin is not linked to any physical place. Bitcoin involves several stakeholders, the main ones being its miners, coders and users. According to the Bitcoin foundation, an American not-for-profit corporation that promotes and supports the currency, but which actually represents only itself, Bitcoin is a way for the entire of society to regain its "financial freedom." They explain, "People everywhere are revolting against their escalating debt yoke, spiraling living costs and the unequal distribution of resources and wealth. Society as we know it is crumbling, and for good reason. Our financial system is broken and people are looking for another way."[23] Yet Bitcoin does not solve the very problem of accumulation of capital – which has often been identified as one of the key problems in today's capitalism (Piketty, 2013). Those who already have capital are likely to be richer than those who do not possess such wealth. And although Bitcoin does not function as debt per se – there is indeed no debtor and creditor, the value of the currency does rely on the anticipation of the overall increase of economic wealth – hence indefinite growth of capital. Bjerg (2016: 67) explains: "A Bitcoin does not represent a claim on any particular debtor but rather a claim upon the whole 'society' of Bitcoin users. Bitcoin is credit money without debt."

The main argument put forward by Bitcoin miners is the ability of the currency to fight censorship by giving the control to anyone who wants to be part of the community. As a matter of fact, thousands of individual miners, hundreds of committed developers and thousands of occasional contributors participate actively in the governance of the currency. Yet questions remain regarding who is actually able to understand and engage in such tasks. The same questions apply to the users and buyers of such currencies. Who is able to grasp the mechanisms of valuation of those new types of assets? These questions are similar to those that have been raised by other financial products, such as high-frequency trading (MacKenzie, Beunza, Millo, & Pardo-Guerra, 2012). High-frequency products have been authorized by financial authorities, on the basis that they were considered as part of a "fair" market, since everybody could in theory access such technology (provided they have the capital).[24] With this in mind, is the fact that everybody could "in theory" join Bitcoin enough to argue that fairness is maintained? Such questions have led some Bitcoin miners to leave the community

[23] https://bitcoinfoundation.org/, accessed 15 January 2019.

[24] See for instance, the mission of the Canadian Securities Administrators: "To give Canada a securities regulatory system that protects investors from unfair, improper or fraudulent practices and fosters fair, efficient and vibrant capital markets, by developing a national system of harmonized securities regulation, policy and practice." https://www.securities-administrators.ca/our-mission.aspx, accessed 13 January 2019.

they describe as a new form of techno-capital elite and join new cryptocurrencies, such as Ğ1 "June" (see next section).

USING A "FREE" CRYPTOCURRENCY TO VALUE HUMAN LIFE – THE EXAMPLE OF Ğ1 "JUNE"

Institution of Value(s)

The project of Ğ1 (pronounced "June") started in 2008 in the aftermath of the publication of an open access book shared by online communities and proposing a new relative money theory (Laborde, 2019) – hence before the implementation of Bitcoin. The actual launch of the currency was done by several programmers in 2017 – some of them having played with other cryptocurrencies before, and some of them being part of groups that launched LLCs.[25] So far, the cryptocurrency remains quite marginal, although it is arousing increasing interest, both in Europe and overseas. The currency grew from 59 members in 2017 to 4,345 at the beginning of 2020.[26] The members of Ğ1 have different ideological and socio-professional backgrounds, including libertarian, anarchist, extreme left and a-political, but all share the idea that the current financial and political institutions are broken. For the members of Ğ1, the main problem with cryptocurrencies like Bitcoin is that the latter reproduces the current financialized capitalist system. In particular, Ğ1 members lament that money supply envisioned by Bitcoin is not distributed equally among humans, instead absorbed by the owners of the most powerful computers, who are often the individuals who are already wealthy in fiat currencies. The main goal of Ğ1 is to provide an alternative way of producing money: through life. Money in the Ğ1 system is co-produced by its members, through the sole facts of their existence and age. Ğ1 provide all members with a daily number of tokens in a way that all generations are equally served in monetary creation share. The accumulated quantity of tokens – expressed in Universal Dividends – is expected to be the same for each individual over his/her life (estimated at 80 years). When a member dies, the money he/she accumulated slowly dissolves while the monetary mass increases.

The founders of Ğ1 decided to incorporate the idea of a basic income into their cryptocurrency, through the Universal Dividend (UD). A basic income consists in providing

[25] See http://www.monnaielibre.creationmonetaire.info/monnaie-libre-n4-openudc/ and http://www.creationmonetaire.info/2011/08/openudc-standard-monetaire-respectueux-des-derniers-entrants.html for further information on the history, accessed 31 December 2018.
[26] https://g1.duniter.fr/#/app/currency/stats/lg, accessed 10 January 2019

all citizens with a sum of money that allows them to live decently, and this unconditionally of who they are and what they do. The idea behind the basic income is that revenues should not be based upon the ability of people to be productive forces, in (capitalist) economic terms, but should simply result from the fact that they are members of that society. The UD is calculated based on the assumptions offered by the relative money theory book (Laborde, 2019).[27] The relative money theory involves restoring symmetry in terms of space and time to fight two injustices: firstly, the fact that only some individuals receive money (e.g. miners); and secondly, the fact that the first movers in a cryptocurrency will benefit from more value than those who join later. The relative money theory relies on four economic freedoms:[28] 1) the freedom to choose our currency system, because money should not be imposed; 2) the freedom to access resources, because we should all have access to monetary resources (and consequently economic resources); 3) the freedom to estimate and produce value, because value is purely relative to each individual; and 4) the freedom to trade with money, because we should not be limited by the available money supply. Free or "freedom-enabling" cryptocurrencies are expected to support a free economic system.

Production of Value(s)

The calculation and production of the amount of money distributed to each member relies on a blockchain. Ğ1 relies on a public blockchain known as Duniter, which does not involve mining. New tokens are automatically issued by the blockchain, on a daily basis and in the form of a UD. The number of tokens present in the UD evolves over time according to a formula from the relative theory of money. The formula is: UD = G (M/N), where G = ln (LE/2)/(LE/2). UD = Universal Dividend, G = Growth of Money Supply (estimated at 9.22% per year), M=Money Supply (total amount), N = Number of Members, LE = Life Expectancy (estimated at 80 years). Since the value of the UD depends on the number of members in the network, the currency is said to be co-produced by the members of the network. Everyone and every organization can agree to be paid, and pay, in Ğ1, but only members of the network can produce the UD. The essential element for Ğ1 members is that money is neither created through debt nor through the accumulation of capital through inflation. The first members to enrol in the network should not benefit from the increase in value of the currency (as it is the case for Bitcoin). It is also crucial that the value of the currency is not dependent on the value

[27] https://wiki.p2pfoundation.net/Relative_Theory_of_Money, accessed 17 December 2018.
[28] https://wiki.p2pfoundation.net/Relative_Theory_of_Money, accessed 3 December 2018.

of another (fiat/crypto) currency, since the goal is to provide an entirely new and alternative system of money.

To achieve such independence, the blockchain algorithm (based on the above formula) is programmed so that all members accumulate the same quantity of UDs over their lifetime (i.e. 80 years). Note that 3,740 UD is the value any member accounts tends to reach if there is no transfer and only the UD accumulating: the older UDs losing value over time as the total monetary mass increases.[29] The maximum number of members envisioned for each currency (Ğ1 can be replicated) is estimated at 1,000,000 (5,000,000 technically) with the money from the deceased being constantly replaced by money from the living. Members have little interest in accumulating tokens since the value of goods and services should not be expressed in absolute numbers (i.e. Ğ1) but in UDs – a value that is constantly adjusted according to the total money supply available in the network and the number of members. Provided all members stay in the network for the same length of time, there is no money asymmetry between members, whether in terms of space or time.[30]

Unlike Bitcoin or the Sol Violette where converting a fiat currency into the cryptocurrency is the only way to enter the system (or by paying for goods and services in Bitcoins), Ğ1 does not require the use of any other form of currency. To produce the daily UD, there is only one requirement, namely to be a member of the Ğ1 network. To achieve this, Ğ1 uses a "Web of Trust" (WoT), which ensures that every member is actually a living human being and that no one receives two or more UDs. The WoT used by Ğ1 is inspired by, although it is operationally very different, the open source software Pretty Good Privacy, which is an encryption program that provides cryptographic privacy and authentication for data communication.[31] The WoT is woven by members themselves. The 59 members who minted the genesis block asserted that they knew each other personally and each then proceeded to "certify" the other members around them. When a new member joins, he or she is given the right to certify future members.[32] However, the process cannot go on forever as the web has a maximum diameter. Each member has a set number of certifications he or she can grant and cannot be "too far" from other members.[33]

[29] This value differs from the actual number of UD created, which is 29,200 (one per day). Note however that the value of a UD created at a young age is worth almost nothing when the member is 80.
[30] Note that if two individuals of the same age enter at different moments, they are unlikely to accumulate the same amount of money over their lifetimes.
[31] https://en.wikipedia.org/wiki/Pretty_Good_Privacy, accessed 17 December 2018.
[32] https://duniter.org/en/introduction-a-la-toile-de-confiance/, accessed 17 December 2018.
[33] https://duniter.org/en/duniter-why-how/, accessed 17 December 2018.

While there is some cryptographic competition to calculate the nodes of the blockchain, there is no incentive in winning the race (unlike bitcoin). Indeed, nodes are calculated voluntarily by members, who can be compensated in UDs through a voluntary redistribution service – although few actually ask for such compensation. To keep the costs of the calculation as low as possible, the blockchain automatically adapts the difficulty of the cryptographic exercise to the computing power of the individuals wanting to calculate the node. Ğ1 developers conceive the system to favor small computers like raspberry Pi[34], maintaining the number of powerful computers to only a few so that the difficulty is considered properly. As a result, the currency is quite cheap to produce, both energy- and resource-wise.

Evaluation of Value(s)

The cryptocurrency is quite recent and its success is therefore fairly difficult to assess. The number of new members continues to increase on a regular basis, but the constraints imposed by the Web of Trust necessarily slow down its expansion. It indeed takes some time for each new potential member to be validated by five existing members. As for the Sol Violette, potential new members are recruited through word of mouth or public information sessions. At the beginning, most individuals have a hard time understanding how money is created, both in the case of Ğ1 and in the existing monetary system (i.e. through debt). When people discover, however, that all they need to do to produce UDs is to enrol online with a wallet, most of them are thrilled and ask to join the network. Proponents of Ğ1 consider it much easier to implement than an LCC, notably because it relies on a simple phone application[35] and there is no need to convert fiat currency in a specific bank. Ğ1 is also said to be a much more egalitarian system than either the Sol Violette or Bitcoin since all members receive the same number of DUs over their lifetime.

In practice, the use of Ğ1 remains quite limited (e.g. purchase of vegetables from a farmer, services between members, second-hand purchases through open-source community forums) but the number of organizations (e.g. restaurants) willing to accept Ğ1 is increasing. All documents are open source and the founders and proponents of Ğ1 are actively involved online and in various communities to encourage the creation of other free cryptocurrencies elsewhere in the world. As for the Sol Violette, educating individuals on the workings of

[34] https://www.raspberrypi.org/, accessed 10 January 2019.
[35] A simple SMS service under development, as well as two physical paper systems too (paper wallets).

money is also an important measure of the currency's success. The ability to provide individuals with a concrete means with which to fight inequality is another. Unlike the Sol Violette whose members do not believe that LCCs can have a large impact via a scale effect, LCCs being by essence local and small in terms of volume, the Ğ1 members envisage this possibility. Although they are aware of their project's utopia, they believe that for the first time in history, a real and alternative system of money creation is being offered.

Territorialization of Value(s)

Although there is no territory attached to the currency per se, the Web of Trust and the requirement to know five members of the network in order to produce the UD effectively bind the currency to a specific physical place. As with the Sol Violette, the Ğ1 is expected to help build stronger ties between people by encouraging real transactions and discussions between members of the network. Yet there is no control as to what a "good" or "ethical" person is and consequently anyone can be part of the network, unlike the Sol Violette, which requests that their ethical merchants live within a specific territory. Likewise, any good and service can be bought or sold with Ğ1.

The use of blockchain technology is also of secondary importance, it is described as a means to an end, a technological revolution that renders possible what was impossible before. In this respect, the founders of Ğ1 strongly distance themselves from Bitcoin and other cryptocurrencies. They label themselves as part of the "free currency" movement, which does not preclude any specific form of technology. What matters to the proponents of Ğ1 is the ability to use a currency to value human beings for what they are, i.e. human beings, not for what they could bring in capitalist terms. They explained, "As you'll have gathered, Duniter's main difference [compared with Bitcoin] is that **it puts humans first**.[36] The money creation is taken care of by humans themselves, not by machines or private corporations. Humans meet and validate each other's capacity to create the money. In the best of worlds, each member would have a calculating node giving each and every one a say in the growth of the network and in future decisions. To avoid confusion between the protocol and the currency, we've distinguished the two, the former being Duniter and the latter the Ğ1. **Tech and economics are two very different subject matters!"**[37]

[36] Emphasized in the original.
[37] https://duniter.org/en/duniter-why-how/, accessed 17 October 2018.

USING A CRYPTOCURRENCY TO RECOUPLE FINANCIAL VALUATION WITH THE REAL ECONOMY: THE EXAMPLE OF IMPAK COIN

Institution of Value(s)

Unlike previous alternative currencies that stemmed from grass-roots movements, impak Coin was created by a private corporation, impak Finance, with the explicit goals of making profits and having an impact. As with other currencies, the motivations of its founders were also triggered by the 2008 financial crisis and involved creating a better economic and financial system. The team that founded impak Coin is composed of seasoned and successful entrepreneurs who made a lot of money during the dot-com bubble. Although they come from the "technology" side, they have a good knowledge of the financial system, notably from the mergers and acquisitions and public listings in which they have been involved over their careers. This experience of raising capital nevertheless gave them the impression that a small elite was in charge of the entire financial system, distributing capital in a way that favored their own individual wealth at the expense of the productive real economy sustained by entrepreneurs.

In the aftermath of the 2008 financial crisis, one of the founders began to closely study the international monetary system and existing alternatives. During his research, he discovered that one bank – Triodos Bank – had lost no money during the crisis because all its assets were invested in "real economy" companies that pursued a triple bottom line approach (i.e. People, Planet and Profit). Once he had realized this fact, the founder started thinking about how he could use his technological knowledge to create a system enabling money to be spent, saved and managed by organizations that support a real economy generating positive externalities. Convinced that this project could work, he and other seasoned entrepreneurs launched impak Finance in 2016, with the idea that this new venture had to be meaningful and a change maker in the world – their legacy for future generations.

In order to "test" their model, the team leveraged their network and organized a dozen "fun" design thinking workshops that gathered key representatives from the financial sector and tech companies. Participants were asked to imagine the bank of tomorrow. At the end of each workshop, participants realized that their "dream bank" was actually a 95% fit with the impak Finance project (source: interview with founder). Through this collective engagement, the team succeeded in raising CAD$1.5 million in equity crowdfunding. In January 2017, impak Finance recruited its first employers, ready to become the first "neo-bank" whose

cryptocurrency would be used to generate a social impact in the real economy. In September 2017, impak Coin closed their first Initial Coin Offering (ICO),[38] the first ICO legally authorized in North America, with a total of MPK 1,690,626 issued for CAD $1,414,860 (89 countries, 2,266 investors). With an additional CAD$1.1 million secured through angel investors, impak Finance succeeded in raising CAD$4 million over 18 months.

Production of Value(s)

The venture, which is B-Corporation certified,[39] is still very recent and most of its resources have been dedicated to fashioning the impak "ecosystem." In fact, at the beginning of 2020, the MPK mobile application was still in a beta version. The reason for this delay is that the success of impak Coin relies on the ability to offer a large "market place" composed of "impact organizations" selling goods and services in line with the pursuit of a triple bottom line – all over the world. For this volume-based project to work, it is important that impak Coins could be used across a significant number of merchants, while also ensuring that these merchants deserve to be accredited "impak members." The first two years of the venture hence involved creating a machine learning algorithm capable of assessing on a large scale whether the ventures eager to become members of the network could be qualified as "impact" ventures (i.e. as sources of positive externalities in the real economy), with qualified ventures then being enrolled. The criteria for measuring impact are based on the principles of the impact management project,[40] an international initiative that supports the sustainable development goals (SDGs).[41]

The first strength of impak Finance is therefore their ability to provide a standardized verified "impak profile" that enables each citizen, investor or consumer to assess in a few minutes whether the organization from he/she wants to buy/invest contributes to an impak economy, notably through the pursuit of the SDGs. Once organizations become "impak

[38] Investors invest money in return for a token, here the impak Coin, with the hope that the value of the token will increase in the future. More information on the ICO can be found at: https://icobench.com/ico/impak-coin, accessed 17 December 2018.

[39] Certified B Corporations are a new kind of business that balances purpose and profit. They are legally required to consider the impact of their decisions on their workers, customers, suppliers, community and the environment. This is a community of leaders, driving a global movement of people using business as a force for good. Source: https://bcorporation.net/, accessed 15 December 2018.

[40] https://impactmanagementproject.com/, accessed 17 December 2018.

[41] The Sustainable Development Goals are the blueprint for achieving a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate, environmental degradation, prosperity, peace and justice. The Goals interconnect and in order to leave no one behind, it is important to achieve each Goal and target by 2030.
Source: https://www.un.org/sustainabledevelopment/sustainable-development-goals/, accessed 16 January 2019.

accredited," they can enter the impak ecosystem – made visible on a map in the application. Each time an impak registered user pays a member organization in fiat currency (or in impak Coins), the mobile application traces the "impak" transaction, and he/she receives MPK rewards (2-5% of cashback). Impact businesses are incentivised to join the network to 1) increase their sales within an extremely mobilized community of potential clients (both B2C and B2B); 2) have access to the free impak Coin "incentive" program; and 3) be visible from the impact institutional investors seeking impact qualified opportunities. The impak ecosystem also incentives qualified businesses to convince their own providers to join, as they will receive MPK cash back for each business-to-business transaction within the network.

While the Bitcoin blockchain issues new tokens when a block is mined, with impak, new tokens are created in the form of "MPK rewards" when transactions occur in the impak ecosystem. Fiat currencies can also be converted into MPK (as for the Sol Violette), but only to the extent that the governance structure of impak Finance authorizes it (see below). The blockchain technology employed is a privately commissioned, permissioned blockchain based on the Ethereum technology (i.e. smart contracts) developed under an open source licence by JP Morgan for its Quorum blockchain.[42] In other words, impak Finance maintains control of the blockchain, there are no miners involved as for Bitcoin and no nodes calculated by its members as for Ğ1. In due course, impak Finance nevertheless expects some selected partners to participate in the creation of nodes. The public keys, which are online "traces" of the transactions validated through the blockchain, will remain publicly available in order to enable future audits of all transactions conducted in the ecosystem.

Akin to the perfect money theory[43] developed by Simmel (1904), the goal of impak Finance is to base the supply of money on the quantity of goods and services exchanged in the real impact economy. When an organization is paid in impak Coins, it can use them in the ecosystem to pay its suppliers (which increases its impact score) or convert them back into fiat currency for a fee of 2.5%. Impak Coins could also be used for peer-to-peer payments, with no transaction fees. Note, however, that MPK rewards cannot be converted into fiat currencies in order to increase the circulation of money (as for the Sol Violette). Impak Finance ultimately hopes to provide organizations with loans paid in impak Coins through microlending, crowdlending and peer-to-peer lending. This system would allow savers to earn interest in impak Coins while investing in the impact economy. The entire financial system

[42] https://www.jpmorgan.com/global/Quorum, accessed 4 January 2019.

[43] According to the perfect money theory developed by Simmel (1904), the stability of commodity money could be obtained through the maintenance of a just proportion – expressed in prices – between the total quantity of money in circulation and the total quantity of commodities on sale.

would thus be re-routed and re-invented to support the financing and purchasing of goods and services with positive externalities, while reducing the number of financial intermediaries.

Evaluation of Value(s)

The intrinsic value of the impak Coin should derive from the growth (or decrease) of the worldwide impact economy and the social and environmental positive externalities of the impact economy it traces. To avoid any speculative behavior and guarantee that the value of impak Coin reflects the value of the impak economy on which it is based, impak Finance controls the conversion and value of the impak Coin in terms of fiat currency. The impak Coin is currently worth CAD$1 and will hold the same value until the launch of impak Coin transactions in the impak marketplace. Akin to the central banks' approach with commodity money and to ensure that the value of impak Coin remains "stable," impak Finance have created an independent governance structure that will adjust the variables (e.g. % of money cashback) of the mathematical function fixing the rate of conversion in terms of CAD$ once a week, and buy or supply MPK with their own reserves (CAD, EUR and MPK initially) to adjust the quantity of money available in the system. Unlike Bitcoin and other "non-stable" cryptocurrencies, impak Coins will not be exchanged on other stock exchanges in order to guarantee that the value of the cryptocurrency is not dictated by other currencies or arbitrage opportunities. As for other cryptocurrency exchange places (and fiat currencies issued by central banks), impak Finance will also maintain ownership of all coins by owning all the "private keys" used by members to execute their orders on the blockchain (note that each order needs a public and a private key to be validated).[44]

Impak finance is expected to make money on several dimensions – on fees (transactions, lending) but mainly through its system of impact assessment, scoring and traceability that will be sold to impact institutional investors and organizations eager to have access to qualified impact businesses and to evaluate their portfolio or supply chain's impact. The cryptocurrency is described as follows, "Coded to support the impact economy development. […] the first stable cryptocurrency designed to support the growth of the impact economy. By design, impak Coin will build loyalty, reward collaboration and encourage its

[44] Many cryptocurrency stock exchanges actually "own" the currencies present in their users' wallets by owning the private keys (i.e. passwords) associated with the wallets. Many open source community members judge this ownership abusive and prefer to keep a "physical wallet" for their money (akin to a USB key). To be able to spend this money, however, the private key is needed, which means that even if someone finds the physical wallet, he/she will not be able to spend the money if she/he does not have the private key (or password). Likewise, if an owner loses the physical wallet, he/she actually loses the money kept in the wallet.

holders to buy from impak accredited members."[45] According to its founders, the success of impak Coin will be indicated by the quantity of money actually in circulation in the impak ecosystem. In December 2018, the impak Ecosystem said to comprise a community of nearly 9,500 citizens, and tens of thousands of businesses and organizations. As with the Sol Violette and Ğ1, impak Finance also seeks to educate citizens on the current monetary system and its (fatal) flaws through their use of the cryptocurrency.

Territorialization of Value(s)

The success of impak Coin will largely depend on its ability to create an ecosystem where individuals (consumers, savers) and organizations share the same desire to contribute to an impact economy. Like the Sol Violette, the goal of impak Coin is to use money as a way to create a real and sustainable economy that emphasizes human connection and the preservation of nature. Unlike an LCC, however, this circuit is not linked to a specific territory and many of the merchants are actually online businesses. Like Ğ1, impak Coin also aims to provide an alternative to the debt model. Indeed, the MPK money supply does not depend on a potential future economic value, but on the transactions that occur in the real economy. However, the model does not address issues raised by the accumulation of capital (Piketty, 2013), in the sense that the individuals who first acquired the tokens are very likely to benefit from the increase in value of the currency. Nevertheless, and unlike Bitcoin, the value of impak Coins does not derive (exclusively) from their exchange value (against other currencies) and their ability to function as a store of value (e.g. by building exclusivity through limiting the number of tokens). The transactions conducted in the real impact economy are indeed expected to anchor the financial value of the currency. The website explains, "An entrepreneur fuelled by a passion for technology, a sustainable development activist and precious, expert allies from complementary backgrounds. Add to that our growing, general sense of urgency in the face of immense global issues, and some major challenges in between, and we end up with an inspired team that took the bull by the horns. We decided to do our part. A little like all entrepreneurs who combine dreams and responsibilities. […] At the very beginning, there's this dream. Will you join us in making this dream come true?"[46]

[45] https://www.impak.eco/en/impak-coin/, accessed 17 December 2018.
[46] https://www.impak.eco/en/our-mission/, accessed 18 December 2018.

DISCUSSION

Since the 2008 financial crisis, the number of alternative currencies all over the world has exploded. Yet, little is known about their goals and workings. This chapter aimed to fill this gap by providing a comparative analysis of the valuation infrastructure of one local and complementary currency (LCC), *Sol Violette*, and three cryptocurrencies, *Bitcoin, Ğ1 "June" and impak Coin* (cf. Figure 1). The valuation infrastructure (Friedland & Arjaliès, Forthcoming) of each currency describes how the value(s) pursued by each currency is instituted, produced, evaluated and territorialized. Based on this analysis, I could show that 1) despite targeting the same financial institutions, the utopia (or societal project) pursued by LCC and cryptocurrencies can vary to a large extent and 2) this utopia shapes the workings of such currencies as much as the technology used to produce money (e.g. blockchain). This framework could be applied to other currencies and innovations, thus contributing to a more systematic analysis of (financial) technologies. Through this analysis, I also illuminated the three functions of money (i.e. media of exchange, store of value and unit of account) performed by the four currencies, as well as their status as debt and social relation (cf. Figure 2). As Figure 2 shows, such functions vary and none of the alternative currency existing currently can be considered as equivalent to a fiat currency, since no country allows their taxes to be paid with such money. The analysis also indicates that the usage of money as store of value, i.e. with an idea that its value will increase in the future, is associated with its role as debt. Lastly, it confirms that all monies are social relations. I will now elaborate on the implications of these findings for the studies of (financial) technologies, their impacts on society and their regulation.

Table 2: The Three Functions of Money of Sol Violette, Bitcoin, Ğ1 "June" and Impak Coin

Alternative currency	Media of Exchange	Store of Value	Unit of Account	Money as Debt	Money as Social Relation
Sol Violette	Yes, but within the SV community, although some conversion into fiat currency is possible.	No, and to be avoided, as money should circulate. The value of the currency decreases over time if it is not being used.	Yes, but within the SV community only, with some possibility to identify the currency as "voucher" into sovereign accounts.	Yes & No, the value of money does not depend on the future availabilities of members to reimburse, although it is indirectly linked to their ability to do so in fiat currencies.	Yes, money is used to connect like-minded people to each other.
Bitcoin	Yes, but within the Bitcoin community, although some conversion into fiat currency and other cryptocurrencies is possible.	Yes, based on the foreseen digital scarcity of the currency, valued by stock exchange markets.	Yes, but within the bitcoin community only, with some possibility to identify the currency as "intangible asset" into sovereign accounts.	Yes & No, the value of the currency depends on the whole capacity of Bitcoin users to reimburse, not a particular debtor.	Yes, the value of money depends on the belief of the community into it.
Ğ1 "June"	Yes, but within the Ğ1 community only.	No, and to be avoided, money should not support accumulation of capital. The value of the currency stays the same over time (relative value).	Yes, but within the Ğ1 community only.	No, the value of money does not depend on the future availabilities of members to reimburse.	Yes, money is used to celebrate human life and relationships.
Impak Coin	Yes, but within the impak community, although some conversion into fiat currency is possible.	Yes, based on the expected increase of value(s) being produced within the impak community, valued by the community.	Yes, but within the impak community only, with some possibility to identify the currency as "loyalty rewards" into sovereign accounts.	Yes & No, the value of the currency depends on the whole capacity of impak users to reimburse, not a particular debtor.	Yes, money is used to connect like-minded people to each other.

On the Relationships between Utopia and Technology

Bitcoin has been described as a "techno-utopia" (Dodd, 2018: 42) whose goal is to use technological means to provide an alternative monetary system to the out-dated banking system, described as full of political hubris, financial ineptitude and underlying criminality. As shown above, however, this focus on the technology is somehow misleading. In cryptocurrencies, the "social consensus" is as much important as the "machine consensus" (Hsieh, 2018; Hsieh & Vergne, 2018). Such currencies are therefore relational projects as much as LCCs are (Zelizer, 2012). As Bjerg (2016: 62) explains, "Bitcoin has value as money only in so far as there is a community of users willing to accept Bitcoin in exchange for commodities, services, or other forms of money. Bitcoin does not have any intrinsic value."

While not core to the sociology of money, the relationships between technology and utopia have attracted a lot of interest in other fields. Socio-materiality scholars have studied how material devices interact with social practices (Jarzabkowski & Kaplan, 2015; Leonardi, 2013; Orlikowski, 2007). Social studies of finance and accounting scholars have shown that calculative devices are not neutral but instead shaped by the assumptions of their designers (Busco & Quattrone, 2018; MacKenzie, 2011; Miller & Power, 2013). Strategists have also explored the relationships between the value proposition and the technological innovation of new business models and strategies – notably to know which one precedes the other (Aversa, Furnari, & Haefliger, 2015). The findings of this chapter are aligned with this body of research. Blockchain technology, as other technologies, is not "neutral" but instead fashioned by the ideals of their creators and users. The technology shapes these ideals in return, as the currency cannot exist without the device that embodies it.

By uncovering the relationship between technology and utopia, the chapter demonstrates that some cryptocurrencies are more similar to some LCCs than to other cryptocurrencies. A cryptocurrency like impak Coin, for instance, is much closer in its functioning and utopia to an LCC like the Sol Violette than it is to a cryptocurrency like Bitcoin. Since alternative currencies all aim to challenge existing financial institutions, previous research has tended to group all cryptocurrencies and LCCs under one homogeneous group (Cohen, 2017). This chapter shows that such analysis is both theoretically and empirically questionable. There is a huge diversity of utopias among alternative currencies – particularly cryptocurrencies – and such utopia is not dictated by the technology. Also, cryptocurrencies do not necessarily oppose LCCs. There could indeed be similar aspirations in both types of currencies. In other words, an LCC can theoretically use a blockchain

technology, hence becoming a cryptocurrency as well, provided its use remains within a local context and in a way that does not search for the "non-specificity" of money (Simmel, 1904) (i.e. the lack of mutual dependence between users). Uncovering these differences is essential to be able to understand the dynamics that inform the rise and development of alternative currencies in the world. If all alternative currencies aim to transform global financial institutions, the mechanisms through which they search to do it and therefore their potential impact vary to a large extent.

On the Ever-Changing Utopias

The rise of alternative currencies in the aftermath of the 2008 financial crisis has been fuelled by a strong rejection of the financial system across the entire political spectrum, as exemplified above. In this sense, LCCs and cryptocurrencies do form a coalition of the unlikely whose common basis is the search for another, more meaningful, monetary and economic system for our world. As explained above, however, what this utopia comprises varies considerably. Members of the currencies themselves can have different interpretations of the same utopia. For instance, some members of Ğ1 would love to use the cryptocurrency as a substantial source of revenues for the poorest members, while other members are mainly interested in the fair distribution of money between generations. Likewise, the utopia can evolve over time. Bitcoin is a good example. Not only individuals have interpreted the utopia described in the Bitcoin paper written by Satoshi Nakamoto (2008) differently, their interpretations have evolved as the currency developed. In addition, and although white papers are broadly used, not all alternative currencies explain in explicit terms their utopias. On this dimension, impak Coin which is entirely managed by a private organization with a clear control of the currency clearly differs from Bitcoin which originated from a grass-root movement. As Frenkel (1977: 12) explains: "Money is not a consciously created artifact, but grows out of, reflects, and in turn affects the ever-changing relationships between individuals and the society which they compose."

With this in mind, several questions can be explored by further research. Are some utopias more likely to support the development of the currency? Is the utopia likely to fade as the currency grows? Are alternative currencies having a loosely defined utopia more likely to evolve and adapt? Is there a systematic relationship between the type of technology (e.g. type of blockchain technologies) in use and the utopias pursued? Such questions echo some research conducted in the literature on social movements and institutional theory notably

(Battilana, Leca, & Boxenbaum, 2009; Benford & Snow, 2000; De Bakker, Den Hond, King, & Weber, 2013; McAdam & Scott, 2005). However, it remains to know if alternative currencies can be theorised as social movements per se, notably due to the diversity of goals pursued and the variety of cryptocurrencies. Other scholars have thus preferred to describe cryptocurrencies like Bitcoin as (decentralized autonomous) organizations (Hsieh & Vergne, 2018). As a matter of fact, most LCCs are actually non-for-profit organizations and impak Coin is a B-Corporation. Likewise, it remains uncertain whether alternative currencies succeed in transforming the institutions they target, to wit: global financial institutions.

On the Regulation of Alternative Currencies

The findings of the chapter have two main implications for the regulatory bodies in charge of alternative currencies, particularly crypto ones. Firstly, the chapter demonstrates that the utopia matters as much as the technology used to produce money. This observation is very important as current regulation relies quasi exclusively on the technology in-use, at the expense of the type of value(s) pursued and produced. This analysis applies to the broad spectrum of financial technologies that have appeared over the past years (e.g. robot advising, artificial intelligence, crypto-assets, etc.). This chapter shows that none of these technologies, whatever complex and sibylline they appear, are "value-neutral." Blockchain technology is multiple and the assumptions under which tokens are issued have considerable influence on the form and content of the cryptocurrency. Uncovering a currency's utopia is therefore of primordial importance when attempting to understand its meaning and workings, thereby confirming the importance of envisioning money as "social relation" (Ingham, 1996, 2013). Researchers and practitioners alike should therefore investigate the ideals as much as the technology when analyzing such innovations. Policy-makers, in particular, should consider the purposes of such innovations when making decisions regarding the added-value of these new activities for the functioning of markets.

Secondly, the chapter shows the importance of reflecting on the creation and distribution of value(s) supported by alternative currencies. Cryptocurrencies certainly appeared as a response to the increase of private accumulation of value by financial intermediaries, and this at the expense of the ultimate savers (Arjaliès, Grant, Hardie, MacKenzie, & Svetlova, 2017). The decrease of transaction fees obtained through blockchain technology however does not necessarily mean that the distribution of value along the investment chain is fairer. Yet most of the decisions made by regulators seem to take the

ability to lower transaction costs as the main criteria for deciding whether a financial technology is beneficial for the markets. For decades and in the aftermath of the Chicago School of Economics, the efficiency of markets was judged on the ability of a financial innovation to optimize supply and demand, often referred to as increasing the liquidity of markets (Fox, 2009). Such rules dictated the usage of algorithms to determine the stock value (Muniesa, 2007) or the legality of practices such as high-frequency trading (MacKenzie et al., 2012). As financial markets are shifting to passive investment, with the use of trackers that replicate indexes, investors increasingly make money on the ability to reduce transaction fees rather than finding opportunities in the markets. Throughout and with the rise of financial technology such as robot advising and blockchain, the regulatory bodies also seem to move from efficiency of markets to transaction cost theory to decide whether a new financial technology is appropriate (Fabozzi, Focardi, & Jonas, 2014; Williamson, 1991). This chapter shows that such approach does not help understand which value(s) is being produced, nor for whom. No regulation of this new phase of technological finance will be achieved if the discussion around the values that financial markets should pursue is keep being silenced. Technology shapes practice, as much as utopia shapes technology.

CONCLUSION

To conclude and although the chapter does not cover this specific aspect, I want to acknowledge that many cryptocurrencies have been launched for financial reasons only. Those financial goals do not mean that there is no utopia, but that this utopia is likely linked to the ideals attached to a market-based economy (Arjaliès & Durand, 2019). Hence cryptocurrencies do not only involve the techno-utopian anarchists that previous research has tended to depict, but also include capitalists likely to use their wealth to appropriate the means of production of capital itself. While cryptocurrencies such as Bitcoin do prevent financial intermediaries from taking fees and power over transactions, it is unclear whether this re-appropriation of value is redistributed equally among those involved in the investment chain. It is indeed very possible that cryptocurrencies are nurturing a new form of techno-financial elite that combines the source of capital and technical knowledge – an elite who might eventually be the same as the one in charge of current financial systems (since the latter are the ones who can buy computers and invest in crypto assets).

Cryptocurrencies are therefore not (only) an expression of a post-capitalist society praising the sharing of capital and knowledge across all citizens (Drucker, 1994), as previous

research implied (Cohen, 2017). While such observation applies to most LCCs, most cryptocurrencies are indeed probably better described as a form of capitalism where ownership of capital is obtained outside dominant social and economic institutions and their control, and this, thanks to new technological media. Yet this chapter also demonstrates that the same technology could be used for different purposes. The examples of Ğ1 and impak Coin show that citizens and entrepreneurs alike are willing to reinvent the society in which they live. Obviously, both projects are in their infancy and their success is as mythical as their dreams. As for LCCs, their members scramble for power and impact, but none of them has ever been lacking aspiration. In an economy of desire, what money wants remains utopia.

REFERENCES

Arjaliès, D.-L., & Durand, R. 2019. Product categories as judgment devices: The moral awakening of the investment industry. ***Organization Science***, 30(5): 885–911.

Arjaliès, D.-L., Grant, P., Hardie, I., MacKenzie, D., & Svetlova, E. 2017. ***Chains of Finance: How Investment Management is Shaped***. Oxford University Press.

Aversa, P., Furnari, S., & Haefliger, S. 2015. Business model configurations and performance: A qualitative comparative analysis in Formula One racing, 2005–2013. ***Industrial and Corporate Change***, 24(3): 655–676.

Bandelj, N. 2016. Thinking about social relations in economy as relational work. In P. Aspers & N. Dodd (Eds.), ***Re-imagining Economic Sociology***: 227–251. New York: Oxford University Press.

Bandelj, N., Wherry, F. F., & Zelizer, V. A. 2017. Introduction—Advancing money talks. In N. Bandelj, F. F. Wherry, & V. A. Zelizer (Eds.), ***Money Talks: Explaining How Many Really Works***. Princeton University Press.

Battilana, J., Leca, B., & Boxenbaum, E. 2009. How actors change institutions: Towards a theory of institutional entrepreneurship. ***Academy of Management Annals***, 3(1): 65–107.

Beckert, J. 2013. Imagined futures: Fictional expectations in the economy. ***Theory and Society***, 42(3): 219–240.

Beckert, J. 2016. ***Imagined Futures***. Cambridge, MA: Harvard University Press.

Benford, R. D., & Snow, D. A. 2000. Framing processes and social movements: An overview and assessment. ***Annual Review of Sociology***, 26: 611–639.

Bjerg, O. 2016. How is bitcoin money? ***Theory, Culture & Society***, 33(1): 53–72.

Blanc, J. 2006. Exclusion et liens financiers: Monnaies sociales, rapport 2005-2006. ***Economica, Paris***.

Busco, C., & Quattrone, P. 2018. In search of the "Perfect One": How accounting as a maieutic machine sustains inventions through generative 'in-tensions.' ***Management Accounting Research***, 39: 1–16.

Cohen, B. 2017. The rise of alternative currencies in post-capitalism. ***Journal of Management Studies***, 54(5): 739–746.

Cohen, B. J. 2004. ***The Future of Money***. Princeton University Press.

Davis, A. 2018. Defining speculative value in the age of financialized capitalism. ***The Sociological Review***, 66(1): 3–19.

De Bakker, F. G., Den Hond, F., King, B., & Weber, K. 2013. Social movements, civil society and corporations: Taking stock and looking ahead. ***Organization Studies***, 34(5–6): 573–593.

Dodd, N. 2016. ***The social life of money***. Princeton University Press.

Dodd, N. 2017. Utopian monies: Complementary currencies, Bitcoin, and the social life of money. In N. Bandelj, F. F. Wherry, & V. A. Zelizer (Eds.), ***Money Talks: Explaining How Many Really Works***. Princeton University Press.

Dodd, N. 2018. The social life of Bitcoin. ***Theory, Culture & Society***, 35(3): 35–56.

Drucker, P. 1994. ***Post-capitalist society***. Harper Business.

Fabozzi, F. J., Focardi, S. M., & Jonas, C. 2014. ***Investment Management: A Science to Teach or an Art to Learn?*** CFA Institute Research Foundation.

Farias, C. 2017. Money is the root of All Evil–Or Is It? Recreating culture through everyday neutralizing practices. ***Organization Studies***, 38(6): 775–793.

Feldstein, M. 1998. ***The political economy of the European Economic and Monetary Union: Political sources of an economic liability***. National bureau of economic research.

Fisher, I. 1911. ***Purchasing Power of Money (New York: Mc Millan)***.
Fox, J. 2009. ***The Myth of the Rational Market: A History of Risk, Reward, and Delusion on Wall Street***. Harper Business New York.
Frenkel, S. H. 1977. ***Money, two philosophies: The conflict of trust and authority***. New York: Basil Blackwell.
Friedland, R., & Arjaliès, D.-L. Forthcoming. Putting things in place: Institutional objects and institutional logics. ***Research in the Sociology of Organizations***.
Helgesson, C.-F., & Muniesa, F. 2013. For what it's worth: An introduction to valuation studies. ***Valuation Studies***, 1(1): 1–10.
Hsieh, Y.-Y. 2018. ***The Rise of Decentralized Autonomous Organizations: Coordination and Growth within Cryptocurrencies***. Ivey Business School, Western University, London, Ontario Canada.
Hsieh, Y.-Y., & Vergne, J.-P. 2018. Bitcoin and the rise of decentralized autonomous organizations. ***Journal of Organization Design***, 7(1): 14.
Hutter, M., Stark, D., & Berthoin Antal, A. (Eds.). 2015. ***Moments of valuation: Exploring sites of dissonance***. New York: Oxford University Press.
Ingham, G. 1996. Money is a social relation. ***Review of Social Economy***, 54(4): 507–529.
Ingham, G. 1998. On the underdevelopment of the "Sociology of Money." ***Acta Sociologica***, 41(1): 3–18.
Ingham, G. 2013. ***The Nature of Money***. John Wiley & Sons.
Jarzabkowski, P., & Kaplan, S. 2015. Strategy tools-in-use: A framework for understanding "technologies of rationality" in practice. ***Strategic Management Journal***, 36(4): 537–558.
Kaelberer, M. 2007. Trust in the Euro: Exploring the governance of a supra-national Currency. ***European Societies***, 9(4): 623–642.
Knapp, G. F. 1924. The State Theory of Money. ***History of Economic Thought Books***.
Laborde, S. 2019. ***Relative Theory of Money*** (Version 2.718 (accessed 16 January 2019)). https://en.trm.creationmonetaire.info/: RTM Multi Format (open access).
Leonardi, P. M. 2013. Theoretical foundations for the study of sociomateriality. ***Information and Organization***, 23(2): 59–76.
MacKenzie, D. 2011. The credit crisis as a problem in the sociology of knowledge. ***American Journal of Sociology***, 116(6): 1778–1841.
MacKenzie, D., Beunza, D., Millo, Y., & Pardo-Guerra, J. P. 2012. Drilling through the Allegheny Mountains: Liquidity, materiality and high-frequency trading. ***Journal of Cultural Economy***, 5(3): 279–296.
Maurer, B., Nelms, T. C., & Swartz, L. 2013. "When perhaps the real problem is money itself!": The practical materiality of Bitcoin. ***Social Semiotics***, 23(2): 261–277.
McAdam, D., & Scott, R. W. 2005. Organizations and Movements. In G. F. Davis, D. McAdam, R. W. Scott, & M. N. Zald (Eds.), ***Social Movements and Organization Theory***: 4–40. New York: Cambridge University Press.
McLeay, M., Radia, A., & Thomas, R. 2014. Money creation in the modern economy. ***Bank of England, Bank's Monetary Analysis Directorat, Q1***.
Meyer, C., & Hudon, M. 2017. Alternative organizations in finance: Commoning in complementary currencies. ***Organization***, 24(5): 629–647.
Miller, P., & Power, M. 2013. Accounting, organizing, and economizing: Connecting accounting research and organization theory. ***The Academy of Management Annals***, 7(1): 557–605.
Muniesa, F. 2007. Market technologies and the pragmatics of prices. ***Economy and Society***, 36(3): 377–395.

Muniesa, F. 2011. A flank movement in the understanding of valuation. ***The Sociological Review***, 59(2): 24–38.

Nakamoto, S. 2008. Bitcoin: A peer-to-peer electronic cash system. ***Https://Bitcoin.Org/Bitcoin.Pdf***.

Orlikowski, W. J. 2007. Sociomaterial practices: Exploring technology at work. ***Organization Studies***, 28(9): 1435–1448.

Peacock, M. S. 2014. Complementary currencies: History, theory, prospects. ***Local Economy***, 29(6–7): 708–722.

Piketty, T. 2013. ***Le capital au XXIe siècle***. Le Seuil.

Proudhon, P.-J. 1849. ***Proudhon's Solution of the social problem***. New York: Vanguard press.

Radford, R. A. 1945. The economic organisation of a POW camp. ***Economica***, 12(48): 189–201.

Savoie, D. 2016. ***Un projet de monnaie locale à Montréal***. http://ici.radio-canada.ca/regions/Montreal/2016/07/04/006-monnaie-locale-montreal-economie-sociale.shtml.

Simmel, G. 1904. ***The philosophy of money***. Routledge (3rd Edition, 2004).

Swartz, L. 2018. What was Bitcoin, what will it be? The techno-economic imaginaries of a new money technology. ***Cultural Studies***, 32(4): 623–650.

Veneris, A. 2018. ***Where do we go from here? Challenges in the era of crypto decentralization***. University of Toronto, Department of Electrical and Computer Engineering and Department of Computer Science. https://mmpa.utoronto.ca/sites/files/mmpa/public/shared/pdf/%232%20-%20Andreas%20Veneris.pd, accessed 10 January 2019.

Vergne, J.-P., & Swain, G. 2017. Categorical anarchy in the UK? The British media's classification of bitcoin and the limits of categorization. In R. Durand, N. Granqvist, & A. Tyllström (Eds.), ***From Categories to Categorization: Studies in Sociology, Organizations and Strategy at the Crossroads (Research in the Sociology of Organizations, volume 51)***: 185–222. Bingley, UK: Emerald Publishing Limited.

Vidan, G., & Lehdonvirta, V. 2019. Mine the gap: Bitcoin and the maintenance of trustlessness. ***New Media & Society***, 21(1): 42–59.

Wang, S., & Vergne, J.-P. 2017. Buzz factor or innovation potential: What explains cryptocurrencies' returns? ***PloS One***, 12(1): e0169556.

Williamson, O. E. 1991. Comparative economic organization: The analysis of discrete structural alternatives. ***Administrative Science Quarterly***, 269–296.

Yue, L. Q. 2015. Community constraints on the efficacy of elite mobilization: The issuance of currency substitutes during the panic of 1907. ***American Journal of Sociology***, 120(6): 1690–1735.

Yuran, N. 2014. ***What Money Wants: An Economy of Desire***. Stanford University Press.

Zelizer, V. 2004. Circuits of commerce. In J. C. Alexander, G. T. Marx, & C. Williams (Eds.), ***Self, social structure, and beliefs: Explorations in sociology***: 122–144. Berkeley: University of California Press.

Zelizer, V. A. 1989. The social meaning of money: "special monies." ***American Journal of Sociology***, 342–377.

Zelizer, V. A. 2012. How I became a relational economic sociologist and what does that mean? ***Politics & Society***, 40(2): 145–174.