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Bitcoin and the Blockchain: a *coup d'état* in Digital Heterotopia?

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“To this war of every man against every man, this also in consequent; that nothing can be unjust.

The notions of right and wrong, justice and injustice have there no place.
Where there is no common power, there is no law, where no law, no injustice.

Force, and fraud, are in war the cardinal virtues.”

—Hobbes, *Leviathan*

“We reject: kings, presidents and voting.

We believe in: rough consensus and running code.”

—David D. Clark¹

1. Introduction

George Simmel’s assertion that money is a “claim upon society”—made in the *Philosophy of Money* (1900/2004)—continues to endure as perhaps the best and most widely quoted

¹ An early days Internet protocol designer, quoted in Russell (2006).

definition of money. This is commonly understood as the idea that money is a claim upon the *state*, though this is problematized not least because the state itself is being defamiliarized by various phenomena, including money itself. This paper examines this problematization and introduces the notion of *digital heterotopia*² as a way of describing and analysing the peculiar and evolving relationship between the contemporary state and digital money.

The paper is organized as follows. In the first section, five pillars underpinning states are introduced and described, and we explain how these pillars work to delineate finite boundaries on the state. The following section discusses how each of these pillars is being weakened, most especially—though not exclusively—by the emergence of new forms of money such as Bitcoin, which we see as but one instance of what we are referring to as digital heterotopia. The last section takes a broader view and relates the attempted decoupling of states and currencies (a digital *coup d'état*) and new organizational and social forms.

2. Five pillars of the state

States are complex phenomena and this is reflected and interrogated in a substantive literature, especially in political science. The state embodies the notion of sovereignty, which binds the state's territory within an administrative structure that has power and authority (Gupta et al. 2006). Among the several pillars that underpin states, we identify five that are relevant to our purposes, insofar as they are affected by digital currencies:

- i) monopoly on violence,
- ii) non-interference,
- iii) fiat money,
- iv) bureaucracy,
- v) statistics.

² According to the Oxford Dictionary of Human Geography, heterotopia is: Any real or metaphorical space that permits thought and action that noticeably departs from the conventions of a society. The term was discussed by Michel Foucault in the late 1960s, and since then many critical human geographers have used it when discussing 'alternative' identities, lifestyles, and political programmes.

Of course one could identify other pillars—such as legislation, democratic representation, the justice system, basic welfare, etc.—but in this paper we focus on these five. An important thread linking each of the pillars is the idea of *finiteness*, or the notion that states operate within defined boundaries.

The first pillar we consider is the state's *monopoly on violence*, which corresponds with its duties to provide security to its population. Nearly four centuries ago, Hobbes (1651/2005) used the biblical creature of the Leviathan to convey his idea of an absolute power upon which humankind should rely to abandon what he depicted as a 'state of nature', which was a pessimistic view of humankind naturally inclined towards a 'war of all against all'. He argued that people must recognize that such a 'state of nature' is destructive, and must accept, on the basis of utilitarian reasoning, the need for a social contract to constitute a supreme actor whose power is absolute and enforced by a monopoly on violence. No exit is allowed; no ethical, moral or religious limit can be posed in front of this power. The Leviathan is total because there is no room for any other rationality, and finite because all people are tied to the social contract.³ Hence, the Leviathan and the body politic are constituted at once and are irreversible. Hobbes's idea of the Leviathan has proved to be alluring and enduring, and, over the centuries, has provided a foundational intellectual basis for the state form that is now ubiquitous. He posed the problem of social order before social sciences were formalized, and proposed a solution that became ideal-typical with a thesis that proved to be performative—i.e. the idea and its practical manifestation came to be mutually reinforcing and constitutive (Austin 1970)—through the following centuries.

Importantly, the Leviathan was neither conceptualised nor operationalised as an unbounded entity, and was implicitly, if not explicitly, confined to the emergent boundaries of the nation-state. These boundaries came to be defined around the second pillar of the state considered here, namely the notion of mutual restraint between states, or the *principle of non-interference*. At the same time as Hobbes' *Leviathan* was published, the modern state's political order was founded with the Treaty of Westphalia in 1648, under which all states agreed not to interfere in

³ For analysis of the state's monopoly of violence, see Giddens (1985), Elias (1982) and Fletcher (2013). For a study of the emergence of bureaucratic surveillance in the state and the economy after 1700, see Dandeker (1990).

any other state's internal affairs. Since then, international governance has had to cope with the difficulties of organizing sovereign states without relying on a higher-level law. This principle of non-interference was important because it provided time and legitimation for states to consolidate internally by structuring bureaucracies and institutionalizing national currencies. Subsequently, the Montevideo convention—which was signed in 1933 at the International Conference of American States—recognized that a state requires and is defined by a distinct territory, a permanent population, a government and the capacity to maintain relations with other states.

The third pillar of the state is *fiat money*—meaning currencies whose value derives from state decree—which has played a pivotal role in making money part of the everyday fabric of people's lives. The most consolidated kinds of fiat money are national currencies, which are unique to a state's territory within which their use is enforced, partly through the state's monopoly on violence. Historically, fiat money is perhaps best seen as a technology that linked states to their economies in fundamental ways, since, for instance, it facilitates trade *and* the control of trade by the state (Dodd 2014: 231). According to Swedberg (1998), following Weber, fiat money contributed to the rationalization associated with the modern state, because money is “formally the most rational means of orienting economic activity” (Weber 1921/1978: 86) and because it facilitates accounting and budgeting. In practice, fiat money achieved a homogeneous monetary mass that could overcome the impracticalities of currency fragmentation, facilitate tax collection, and thus effect sovereign authority. Importantly, a single national currency makes it more feasible to institute universal taxation, which is the main source of revenues for states. In addition, stable taxation systems allowed states to leave economic activities to capitalist ventures (Swedberg 1998). Over time, private banks acquired the capacity to create money by giving loans, while states maintained the role of overseeing credit and debt, out of which emerged the contemporary system of finance. In sum, the creation and consolidation of a homogeneous—multipurpose, generic and fungible—monetary mass, which could be used to pay soldiers, taxes, debt and trades (Graeber 2011) as much as to manage the economy, gained traction by constituting states as isomorphic with a defined territory and a fixed population.

The fourth pillar of the state considered here is *bureaucracy*, which is the state's administrative apparatus that, *inter alia*, connects elected bodies (parliament, government) to citizenry. In other words, the state is articulated by bureaucracy, which has the role of bridging and connecting the formal political sphere to citizens. Ideally, bureaucracy guarantees equal and

universal access to the state and downplays the role of tradition and charismatic figures (Weber 1962). According to the model of liberal democracies, citizens elect their representatives who then are expected to deliver their mandate through the bureaucracy, over which they claim exclusive authority. Historically, bureaucracy was legitimized by the rationalization of society wherein relations with citizens were channelled into formal procedures. However, it became clear that bureaucracies also gained autonomous power—famously termed by Weber (1930/2002) as a dystopic “iron cage”—which described societies that had become straightjacketed by formal bureaucratic procedures of all sorts.

The fifth and last pillar that states developed through recent centuries is *statistics*. The first systematic collection of factual information coincided with the extension of seventeenth century European states’ administrations, the main purpose being to monitor and manage trade, and thus to exact taxes (Collins 1994). In Germany, government bureaucracy was tied to universities, where law professors initiated a new discipline called *Staatswissenschaft* or state science. This was the origin of statistics, which still maintains those roots in its etymology, and is used to refer to information about states. Numerical analyses of societal issues were not new, but state administrations came to rely on them for their normal functioning as no other organization before.⁴ Again we find how crucial it is that states have fixed borders and a defined permanent population, as the finiteness of a set of data is basic to statistical significance (10% of an unknown population is not informative).⁵

In practice, the police, army, currency, bureaucracy and statistics together provide infrastructural resources for the modern state. Symmetrically, since the seventeenth century (the golden age of the state/currency alliance) “the modern nation-state provides a crucial infrastructure for modern territorial currency: through its policing powers, its importance in the domestic economy, its centralized authority, and its capacity to garner trust” (Helleiner 2003 quoted by Dodd, 2014:212).

⁴ These developments intersect with the argument that accounting systems can be seen as a microphysics of power that facilitate the governing of individual and organizational behaviours (Miller and O’Leary 1987).

⁵ Not only was the emergence of statistics contemporary with the consolidation of European states, but the formalization of sociology as an independent discipline takes its momentum from the spread of Enlightenment ideas through European states subsequent to the French revolution.

These five pillars are not static structures; rather, they are *performative* in the sense that they contribute to and indeed constitute the states' continuous reproduction and maintenance. The notion of performativity means that statements only make sense within a self-referring and self-reproducing system of practices and beliefs that are mutually validating and sustaining (Barnes 1988). This idea of self-reproduction was originally observed as the capacity of biological systems to reproduce and maintain themselves, a phenomenon referred to by Varela *et al* (1974) as *autopoiesis*. The notion was later extended to social systems, especially by Luhman (1995) who is perhaps the best-known advocate of the view that societies are constituted by social systems that are self-reproducing as much as self-referential. Like cells, social systems create their own boundaries and keep themselves alive according to their internal logic, which is not derived from the system's environment. According to this theory, social systems are operationally closed and autonomous although this does not imply a complete disconnection between the system and the environment. Rather, systems interact with their environment, and while there is an overall increase in entropy, individual systems—whether these are cells or organisms—work to preserve themselves and their internal order. Autopoietic systems can be contrasted to *allopoietic* systems such as a factory, which—while it has input of raw materials and output of final products—does not reproduce itself like a living organism.

In conclusion, we find the concept of autopoiesis important as a way of summarising and describing the state's tendency and ability to maintain inner order with a remarkable degree of independence from the outside world. The five pillars described above support this process and mutually reinforce one another. What is equally important is the notion that the five pillars have worked to circumscribe a state with a finite domain of influence, and, even if the boundary may be subject to contestation, *finiteness* is routinely taken as a *sine qua non* of the modern state. Our argument is that this finiteness is now being problematized, most especially by new forms of digital money and the infrastructures on which they are built. It is to this that we now turn.

3. Finite States and Digital Heterotopia

If we move our attention to the “short 20th century”, commonly seen at the apotheosis of state power, we find a world where no place is not part of a state. Furthermore, with the very few exceptions of neutral countries, we find a world that is divided into two blocs of states, in which

no elsewhere is possible. We argue that this is being challenged by contemporary forms of *digital sociability*, which, in particular, are problematizing the idea and practice of the states' finiteness. Indeed, the turmoil at the beginning of this century—starting with the collapse of the Eastern Bloc and the emergence of a multipolar world, as well as contemporary economic crises—is calling into question the practical and ethical desirability of an organization (the state) that in principle does not tolerate external interference.

Turning to currency, and the way the state and its currency mutually reinforce one another, we find that this is being interrogated by monetary unions that lack full political integration, such as the Eurozone, and by cryptocurrencies like Bitcoin, which are our focus in this paper. What interests us and many others is that even though the Bitcoin economy is tiny compared to fiat currencies—but remarkable compared to alternative and local currencies—it is the genesis of a currency (intended as a mode of allowing and authenticating transactions) that is explicitly aimed at threatening several of the quasi-monopoly powers that the state has built up over centuries. Each state has traditionally exercised these powers through various institutions, but perhaps none is as influential as the state's central bank, which plays a significant role in a range of key activities: setting credit rates and monetary policy; deciding on and implementing exchange rate policies; surveying and collecting data on citizens and corporations; assuring the robustness of the payment infrastructure; protecting the interests of consumers; controlling money-laundering; and regulating/supporting existing financial service providers (Murphy 2014).⁶ The allure of cryptocurrencies, such as Bitcoin, is that their design is aimed at decoupling the state and the currency from one another, which could potentially undermine and unravel the state's deep web of interconnected activities. Here, it is worth remembering that local and alternative currencies have not challenged the state in any substantive way, even though they are examples of currencies that are decoupled from the state. Importantly, and in contrast to cryptocurrencies, local currencies rarely span across different states—they are local after all—and pose no challenge to the state's sovereignty. Remarkably, they often lack the disruptive positive network externalities that characterize information infrastructures and allow few successful services to scale quickly to hundreds of millions of users or more. In other

⁶ Central banks, of course, rely on a wider nexus of “centralized state power, with its ubiquitous organs of standing army, police, bureaucracy, clergy, and judicature” (Marx 1871/1968).

words, rather than seeing digital money in relation to communities, we are more inclined to look at how they relate to crowds, or multitudes using Hardt and Negri's (2000) terminology.

The seminal contribution to the Bitcoin phenomenon was by the mysterious individual or group (a folk hero of the information society) known as Satoshi Nakamoto, who published a paper that set out the basis for the blockchain on which cryptocurrencies such as Bitcoin and other possible services are based (Nakamoto 2008). The blockchain is a public record or ledger of transactions maintained by a dispersed and open-ended number of 'miners', who provide computing power to maintain and guarantee the integrity of the ledger, and is usable by whoever installs a 'wallet' on a digital device. In this system, the micro/macro link is not based on a social contract nor maintained by an unbounded power. Rather, scalable and publicly accessible computing resources coordinate this vast agglomerate of transactions.

Remarkably similar to Hobbes's state of nature, Nakamoto begins with an imaginary world populated by trustless individuals. The problem he addresses is how to enable trustworthy transactions on the internet, which does not have a fixed population, without recourse to a trusted third party, such as a state-regulated (or state-supported) bank. Indeed, in line with libertarian ideology, one of Nakamoto's key objectives was to preclude the possibility of any single and all-encompassing ruling authority emerging. His elegant solution is Bitcoin, a purely digital cryptocurrency that is not administered by any constituted organization and is not circumscribed within any consistent jurisdiction. Hence, Bitcoin is built around scarcity (money cannot be infinite) and absence (no guarantor) and, unlike traditional currencies, it is not linked to precious metals, nor to a state (fiat money), nor to credit (banks). In short, Nakamoto's architectural innovation is designed to make it impossible to either double-spend money—which would create immediate infinite inflation—or for a single central authority to emerge. If Wikipedia can be interpreted as “a community of dissensus” (Jemielniak 2013: 84), Bitcoin can be seen as *trustless consent*. Paradoxically, the design and implementation of these impossibilities is creating new, unforeseen possibilities.

Nakamoto's attempt to create a money system without a central authority is perhaps best analysed at the intersection of diachronic and synchronic issues. Historically, the blockchain is one of a long string of information technologies that, since the 1960s, have avoided centralization tenaciously, partly as a defence against possible Soviet nuclear attack, and partly in sympathy with the Western liberal culture of the 1960s and 1970s. By eluding consolidated control points and circumventing the consistency of jurisdictions, contemporary infrastructures

weaken some of the theoretical and political pillars of social order derived from states. At the extreme, cross-jurisdictional access that open infrastructures facilitate is erosive—and potentially disruptive—for states because it challenges the state's finiteness, akin to a little hole making a whole tyre flat.

Sometimes it is argued that the concept of dystopia does not make sense as the opposite of utopia because utopia, by definition, identifies a place or a society that does not exist. Foucault and later human geographers like David Harvey and Edward Soja have used the idea of *heterotopia* to identify places where hegemonic norms and constraints do not apply: where autonomy (self-rule) is favoured over heteronomy (subject to external authority). Foucault (Foucault and Miskowiec 1986) first used the term to describe spaces with multiple meanings, that reflect other spaces, and where juxtaposition is pervasive. He identifies different types of heterotopias, giving numerous examples including motel rooms, cemeteries, libraries, Scandinavian saunas, ships, gardens, psychiatric hospitals, prisons, and boarding schools. The blockchain manifests these various attributes of heterotopia, but to distinguish it from other instances identified by Foucault we refer to it as a *digital heterotopia*. Most broadly, the blockchain is a growing element of the 'cyberspace', which has already been identified as a form of heterotopia (Young 1998; Saco 2002; Rymarczuk and Derksen 2014), but it also has particular and peculiar features which Foucault highlighted as defining attributes of heterotopias. For instance, Foucault "noted how a society, as its history unfolds, can make an existing heterotopia function in a very different fashion" (Foucault and Miskowiec 1986: 25), which we see with the blockchain, which, while originally developed as the basis for a money system, is now being touted as information infrastructure for all sorts of authentication purposes (DuPont and Maurer 2015). Juxtaposition is also a defining feature of heterotopias, and we see this with the blockchain which is at once an enclosed system and a site of open commerce, an imagined centre of finance and a centre-less network. Crucially, it is the basis for a market, which, as Stallybrass and White (1986) have shown, is an exercise in juxtaposition:

At the market centre of polis we discover a comingling of categories usually kept separate and opposed: centre and periphery, inside and outside, stranger and local, commerce and festivity, high and low. In the marketplace pure and simple categories of thought find themselves perplexed and one-sided. Only hybrid notions are appropriate to such a hybrid place. (1986: 27)

Foucault identified libraries and museums as one type of heterotopia that works at "indefinitely accumulating time" (Foucault and Miskowiec 1986: 26). Again, the blockchain operates

according to a similar logic in that it is an indefinite accumulation of all transactions held in a public ledger, which is incessantly and inexorably growing.

The blockchain is also a good instance of a heterotopia if we take Harvey's extension and critique of Foucault's concept. For Harvey, utopias point to *closure* as fundamental and unavoidable whereas the 'production of space', following Lefevre, should remain an endlessly open possibility (Harvey 2000). In more evocative words "the ship is the heterotopia *par excellence*. In civilizations without boats, dreams dry up, espionage takes the place of adventure, and the police take the place of pirates" (Foucault quoted by Harvey 2000: 183). Libertarians cultivating the technological myth (Miscione 2014) of autonomous technologies would subscribe to this. For his part, Soja stresses how

Foucault focused our attention on another spatiality of social life, an 'external space'. The actually lived (and socially produced) space of sites and the relations between them. . . Foucault's . . . space of heterotopias is another space . . . actually lived and socially constructed, concrete and abstract at the same time, the habitus of social practices. (Soja 1989: 17-18)

According to Harvey, Foucault uses the concept of heterotopia to escape established norms and structures in favour of alternative processes of social orderings that do not limit imagination, otherness and difference: "it is within these spaces that alternatives can take shape and from these spaces that a critique of existing norms and processes can most effectively be mounted" (Harvey 2000: 184). Interestingly, this line of argument—which advocates for autonomy from dominant social order—is at odds with Foucault's well-established view that power is omnipervasive, thus it precludes alterity. We see the same problem with the actors involved in our case. On one side the blockchain fits easily the narrow understanding of an attempt to escape the existing social order in which states and banks are dominant players. On the other, we can see how those established institutions are being capable of appropriating and transforming this emergent technology. This sets the scene for our theoretical interpretation. However, before discussing digital heterotopia in relation to each of the five pillars introduced earlier, we need to introduce a methodological note.

Large scale information infrastructures, in general, and digital currencies in particular, exceed any state, and hence routinely expose their designers and users to globally dispersed and patchily regulated interactions and social relations. Thus, the traditional unevenness of international relations, due to the absence of a law that stands above states, is not an exclusive concern of governments and multinationals anymore, but of any contemporary organization

and even individuals. This condition poses peculiar problems to the social study of information infrastructures and new digital currencies in particular. The actor-network injunction to ‘follow the actors’—i.e. to focus on performance—is practically impossible due to the sheer scale, technical intricacies, global dispersion and far-reaching effects of currency-related phenomena. Focusing on visible action can also be misleading theoretically because it misses the “influences which operate behind the back of agents, and which therefore cannot be found in micro-situations” (Knorr-Cetina 1981: 28) or what is purposefully avoided. Thus, this research

can be seen via what Bowker calls an ‘infrastructural inversion’: a figure-ground gestalt shift in studies of large scale technological change. This inversion de-emphasizes things or people as the only causes of change, and focuses on infrastructural relations (e.g. between railroads, timetables, and management structures in bureaucracies). It inverts traditional historical explanations and reveals how choices and politics embedded in such systems become articulated components. Substrate becomes substance. (Star and Ruhleder: 1996)

By way of analogy, if one intends to study electricity, one option would be to see how individual actors use it to perform routine actions, which would entail checking consumption, appliances used, migration from non-electrical devices, discussions about usage, bills, breakdowns, etc. The other option is to consider electricity as a broader social and historical phenomenon⁷. This stance allows to highlight aspects which may remain invisible at the level of observable actions. For instance, economic and political trade-offs depending on different modes of electricity production and distribution reflect international power relations and conflicts related to energy in general. So, studying the functioning of cryptocurrencies in relation to other currencies and organizations can provide an unorthodox view on aspects of contemporary societies.

What is striking about an infrastructure is its tendency to slip into the background, to become part of the taken-for-granted, and yet never lose its potent relational position connecting with and enabling all sorts of practices. Infrastructures are hugely important, if often overlooked or unseen, because they enable a host of different practices. The blockchain is one such infrastructure and it exhibits each of the five properties identified by Star and Ruhleder’s (1996). First, it is embedded or ‘sunk’ into other structures. This is clearly the case with the blockchain, which is often likened to a system of rails on which the Bitcoin system operates. At

⁷ Well illustrated by Hughes, T.P., *Networks of Power: Electrification in Western Society, 1880-1930*. Baltimore: Johns Hopkins University Press, 1983

present, the blockchain supports heterotopian money—i.e. Bitcoin—as an application, but many other applications are possible if not probable, and each of these will sit on either the existing blockchain or on a new blockchain that would operate on the same or a similar set of architectural principles. Second, the blockchain is transparent, in that it does not have to be reinvented each time. The protocol is open source and so new blockchains, or variants on the blockchain, can be relatively easily created. Third, the blockchain has reach or scope; it is not a one-off event or a one-site practice. Fourth, it is associated with a community of practice, in this case the blockchain and Bitcoin players. Finally, it is linked with conventions of practice, in that it “both shapes and is shaped by the conventions of a community of practice” (Star and Ruhleder 1996: 113). We now examine how each of the five pillars of the state is being, and is likely to be, affected by, *inter alia*, the emergence of digital money.

3.1. Monopoly on violence

In the main, theories of money only consider violence as incidental to money's functioning, i.e. there are conflicts related to money but money is not constituted by violence, *per se*. Some broader analyses do acknowledge that the organisational forms and practices relating to money cannot be separated from powerful, and sometimes violent, actors that have co-emerged with and played a key role in the evolutionary process through which capitalism has come to be (Aglietta and Orléan 1984; Graeber 2011). Indeed, there's a strong argument that since the inception of the Leviathan ideal-type, the state's monopoly on violence has been fundamental to the constitution of state power, and the state, in turn, is constituted by the power to create and control the money system. We can see this in the utilitarian translation that Hobbes envisioned from violence that anyone can use towards anyone else, to the centralisation of violence under state control.

Currencies have a regulatory function, in that they maintain social order by channelling social tensions into contracts—which a money system makes meaningful—and which then can be regulated. But channelling violence does not mean eradicating it, as breaching contracts that money allowed in the first place may—through regulated processes—call for the state's force to be mobilized. The jurisdictional—as much as organizational—problem occurs when the

monopoly on violence conflicts with the principle of non-interference, which happens, for instance, when actors to be prosecuted are in foreign states.⁸

From this perspective, it is relevant to consider the changing role of the state in relation to money. States can create their own currency, instil trust in it or enforce its use because of their authority, thus reducing the overall amount of violence in society. If a state currency is a Leviathan's instrument that reduces the violence of all against all, then an interesting question is what happens if this Hobbesian argument is a) undermined by foreign currencies whose influence exceeds their states' borders, or, more radically, b) circumvented by currencies like Bitcoin that do not rely on states at all? Regarding a), which we will only incidentally discuss here, Marazzi (1995) has argued that after the collapse of Breton-Woods it became apparent that the US Dollar, as GB Sterling before it, had displaced gold to become the "money of all monies". In other words, a US-led world order has emerged which relies on the US Dollar and which has given the United States an "exorbitant privilege"⁹. Regarding b), the scale of the issue is of course minor but its intricacies are not. The most evident problematization brought about by Bitcoin is that it does not depend on any state and, with appropriate technical cautions, can be used by actors who may not be ascribed to any sovereign. One consequence of the grey area between the monopoly on violence and the principle of non-interference is that it is difficult to enforce legal actions, and so it is perhaps unsurprising that Bitcoin is attractive to those wishing to trade at or beyond the margin of legality. Symmetrically, customer protection is diminished within the Bitcoin system since there is no obvious organization to which one might appeal to right a perceived wrong. Bitcoin is still small beer, but what it does sketch is a high volatility world with lots of new business ventures, bankruptcies, and sharp practice: a 'world wild west' in which the sheriff is another cowboy in the crowd.

While they are separated by nearly four centuries, both Hobbes and Nakamoto begin with very similar views about the (albeit fictional) 'state of nature', which both see as trustless and

⁸ A recent and high profile example of this occurred in May 2015 when the United States effected the arrest of FIFA officials in Switzerland. As The Washington Post put it, "The idea of the United States as the world's police force is rarely understood to be so literal" (Bump 2015). The alleged bribe was, of course, denominated in dollars.

⁹ The term was coined by Valéry Giscard d'Estaing, French Minister of Finance in the 1960s (Eichengreen 2011).

potentially conflictual. Despite their shared origins, they end up in quite different destinations: the Leviathan and the blockchain, both of which are radically different ways of addressing essentially the same problem. From the very different organizational forms that have come to be from their writings we can see the performativity of theory: the Leviathan provided a theoretical foundation for modern states, while the blockchain creates an information architecture that mobilizes a new wave of 'crowds' while seeking to elude consolidated organizations (even if the emergence of 'mining pools' shows that consolidation is not absent from the blockchain in practice). Hence, Hobbes and Nakamoto provide complementary analytical lenses through which one can examine the other, as well as interrogate the long-term transformations of state, money and violence, both in theory and practice.

Aglietta and Orléan (1984) see money as a social institution that resolves the social tensions between interdependence and conflict. In a digital heterotopian context they play out quite differently because, unlike citizens of the same state, Bitcoin players may not be interdependent and may not find a higher authority to appeal whenever a controversy spans inconsistent jurisdictions. So, if for Aglietta and Orléan violence is never too far from monetary relations, in digital heterotopia violence seems to be curbed by a faceless algorithm that certifies transactions but is not responsible for anything else, whereas states are. This leads to interesting questions about what violence means or might mean in a 'digital' society. Already we see the emergence of new forms of exclusion, policing, and judicial processes are already emerging: Google blacklists sites that don't conform to their regulations, Twitter silences trolls, Facebook shuts fundamentalists' accounts, cyber-crime and cyber-bullying are proliferating, while the digital version of solitary confinement is simply not being able to connect to the internet. Moreover, the IT multinationals that dominate much of the internet are increasingly using technologies that were previously the preserve of the military or of police forces. For instance, Google is developing driverless cars, Apple uses fingerprint ID as a credential, while Amazon is beginning to use drones as a mode of delivery, while Mazzucato (2011) has shown that the iPhone is replete with technology that was originally developed by or for the US military.

3.2. Principle of non-interference

Ever since the Westphalia Treaty was ratified in 1648, relations between states have continued to be characterized by the principle of non-interfering in the internal affairs of other states, even

if the forces of globalization are eroding the state's sovereignty over both territory and population. Indeed, this phenomenon is not of recent vintage. Before the current crisis, Strange (1999) suggested that the Westphalian order was undermined, among several causes, by money issued by private financial organizations, which is the financial component of a broader phenomenon that she termed "Westfailure". For her, Westfailure also refers to the failure of the Westphalian order to protect the environment and preserve an appropriate balance between rich and poor. To this, we can add that Westphalia lacks sufficient capacity to handle actions across-states. We see this in the way organizations and even individuals become more nomadic, i.e. routinely choose the jurisdiction in which they wish to be accountable: supply chains exceed all borders and affect everyone, foreign currencies affect prices within other states, multinationals move resources across jurisdictions and register in loose regulation or low taxation countries¹⁰, while internet users use services provided from different jurisdictions. The openness of contemporary information infrastructures does not mean that power cannot be exercised through them. For instance, in 2012 the European Union banned Iranian banks and its central bank from accessing Swift, the standard platform that financial organizations use to exchange information (Norman 2012). The blockchain, which can perform a similar function to Swift, is designed to ensure that there is no ruling authority with this kind of power, which make it an important instance of an *infrastructure* that enables cross-state actions. While it is certainly not the only threat to the Westphalian state, it is quite clear that the principle of non-interference can get little traction within the infrastructure that is the blockchain. In other words, Westphalia is a form of order that is confined to the 'finiteness paradigm'; but it does not work well in digital heterotopia.

Mead's understanding of heterotopia as "a collection whose members have few or no intelligible connections with one another", suggests that a feature of digital heterotopia is that the rule of law is questioned and social contracts come under strain. What we see is that openness *between* societies pulls the rug from under the Leviathan's feet. As globally dispersed actors cherry-pick a jurisdiction for each of their actions, the co-existence of many states drifts into stateless or perhaps feudal organizational forms as mutual obligation—the basis of the body politic—fades.

¹⁰ The shadow economy in Europe accounts for between 10 and 20% of the economy, not including legal tax avoidance by multinationals (Schneider and Kearney 2011).

And there is a concern that the global flows of resources, facilitated by information infrastructures and especially by the emergence of cryptocurrencies like Bitcoin, may bring about a renewed state of nature.

3.3. Fiat money

Digital heterotopia is also a cold place for *fiat money*—money that is deemed legal tender by state—which is the third pillar of the state. This pillar has already been undermined by the exponential growth of credit money, based on central bank guarantee—and more recently of post-credit money, based on interbank loans (Bjerg 2014)—which have reduced states' control over money. In addition, some sovereigns have been decoupled from their national currencies—witness the Eurozone—creating anxieties centred on the uncertain relationship between monetary and political union. Bitcoin, a money system that is outwith the state, only adds to this ontological unease about the function and nature of the contemporary state.

Simmel defined money as “a claim upon society”, which is usually interpreted as, for example, owning Sterling Pounds being a claim upon the United Kingdom as much as Deutsch Marks used to be a claim upon Germany. However, the progressive decoupling of sovereigns from their currencies makes this interpretation troublesome. Indeed, today the Deutsch Mark is not in circulation anymore and the Euro is neither a claim upon Germany nor any other Eurozone country. Still the European Union has its own central bank—albeit with more limited mandate than others—and other supranational political institutions. Bitcoin, by not relying on any of those organizations, has taken a step further in decoupling Leviathans from currencies. Indeed, “Bitcoin is a claim upon a state(s)” makes as little sense as “10% of an unknown population” and “a monarch without subjects”. Without finite contexts of reference, currencies—as much as states, bureaucracies and statistics—need to reconsider their ontological and practical relevance. And this is not just academic-speak, as these problems come to the fore when anything goes wrong with Bitcoin. For instance, it is difficult to find any organization to which one can appeal to redress a wrong if Bitcoins are stolen. Unlike a credit card fraud, where a transaction can be reversed by the card-issuing organization, there is no easy way to get Bitcoins back, once they've been stolen.

One way to progress things is to stay with Simmel, in accepting his view of money as a claim on society, but also accepting his understanding that society and the state are not necessarily (or helpfully) isomorphic with one another. Indeed Simmel himself may have provided a suitable

concept, *Vergesellschaftung*. This term has different meanings, for example it can mean either turning something into a part of society or the process of integrating someone into society (socialisation), though usually the concept is translated into English as ‘forms of association’ or simply ‘sociation’¹¹. The latter term, ‘sociation’, is also related to sociability, which Simmel sees as

the art or play form of association, related to the content and purposes of association in the same way as art is related to reality . . . Associations are accompanied by a feeling for, by a satisfaction in, the very fact that one is associated with others and that the solitariness of the individual is resolved into togetherness, a union with others. (Simmel and Hughes 1910/1949: 254–5)

In the German language, sociability refers to both association and coziness, which suggests that society, for Simmel, is defined as a number of individuals connected by interaction. These relationships—or forms of (as-)sociation—are crucial in this analysis because they demonstrate that society is not a thing but a set of events or practices that overcome the individual/social dichotomy. Compared to society *qua* state, sociation is a much more fluid and even playful concept that focuses on immanent social relations rather than an abstract notion like ‘society’ that exists above individuals. Thus, money is perhaps best seen as a claim upon *sociation*—rather than a claim on society (*qua* state)—or as a claim upon the potential and continuous becoming of social relations that might or might not be influenced by the value of any particular form of money. In fact, no person or organization can be legally forced to accept a non-legal currency, and no state is going to exact taxes in another currency but its own. Nonetheless, individuals as much as formal and informal organizations engage in different ways in the use of Bitcoin for their transactions, thus “sociations”. By doing so, Bitcoin users lose *fiat fungibility* because they can claim no obligation for others to accept their money. On the other hand, they find an undefined environment in which, in spite of lack of enforcements of last resort, others give value to those encrypted strings of numbers and engage in trades which might be impossible otherwise.

Practices embedding blockchains are also pushing this infrastructural technology into new domains. As described earlier, Bitcoins are digital items whose scarcity is certified by the blockchain. This scarcity without state-backed authentication applies well to currencies but also

¹¹ For more on the difficulty of this translation see Swedberg and Ogaevall (2005: 12).

to trans-jurisdictional record-keeping (of properties, identities), data analytics of global public records (blockchain goes beyond opendata), transnational remittances (BitPesa), decentralized Turing machines (Ethereum, Eris). These open-ended transformations resonate with heterotopia, by which “Foucault means the coexistence in 'an impossible space' of a 'large number of fragmentary possible worlds' or, more simply, incommensurable spaces that are juxtaposed or superimposed upon each other” (Harvey 1989: 48).

3.4. Bureaucracy

Bureaucracy is partly legitimized by its ability to standardize social relations, which are channelled into formal procedures that are the same for any citizen or organization and which, in turn, facilitate the coordination of micro and macro activities. In digital heterotopia—where the possibility of a dominant organization is theoretically precluded—the blockchain performs a similar function of mediating micro-actions and macro governance of social relations without the need for an all-encompassing organization ultimately rooted in a social contract. The parallels between bureaucracy and the blockchain warrant further study in so far as both can be seen as *technologies*. Table 1 initiates such an exercise by contrasting the elements of Weber’s (1921/1978: 220–221) classic description of bureaucracy with the blockchain, as originally developed by Nakamoto.

Bureaucracy	Blockchain
Official business is conducted on a continuous basis	The blockchain operates continuously
Work duties are delimited around impersonal criteria	Mining is also based on impersonal protocols
The bureaucrat is given the necessary authority to carry out assigned functions	Miners compete to complete designated tasks, while the blockchain protocols ensure that ‘authority’ (or what is deemed to be authoritative) emerges
The means of coercion at the bureaucrat’s disposal are strictly limited and conditions of use are strictly defined;	The blockchain protocols strictly limit what mining devices can and cannot do
Every official's responsibilities and authority are part of a vertical hierarchy of authority, with respective rights of supervision and appeal	Miners operate in a flat organisational structure where authority emerges through computing power. Notions of supervision and appeal do not really exist.
Officials do not own the resources necessary for the performance of their assigned functions, but are accountable for their use of these resources	Miners typically own the resources they need.
Official and private business and income are	The blockchain and its operation are public,

strictly separated	though actors can have some anonymity rather than privacy.
Offices cannot be appropriated by their incumbents (inherited, sold, etc.)	Miners can inherit or sell their practices.
Official business is conducted on the basis of written documents and protocols	The blockchain's algorithms (protocols) are automated;
There is separation of powers between the politician and the bureaucrat: 'At the top of a bureaucratic organization, there is necessarily an element which is at least not purely bureaucratic'.	There is no clear separation of powers in the blockchain, nor are there obvious governance mechanisms (being an open source project, the collapse of the Bitcoin foundation, for example, may not necessarily mark the end of Bitcoin)
Bureaucracy deals with citizens and those who are entitled to rights by the state	Blockchains regulate all transactions of any user without distinction

Table 1: Two organising technologies.

Table 1 highlights some important similarities and differences between bureaucracy and the blockchain, and indeed this exercise could be extended, especially because significant variations on the blockchain—such as Ethereum, Ripple, Cordus, and Eris—have emerged in recent years. An important driver for these variations is the perception that some versions of the blockchain could be used where an authoritative, public—or quasi-public—record is needed and where an authorizing authority is not wanted or not trusted. Examples are proliferating, including passports, contracts, title deeds, and a variety of registers, many of which are at the core of the state's bureaucratic activity. The blockchain itself is an embryonic technology, and it faces serious scalability issues, but there is enough evidence and activity, not least in venture capital investment, to suggest that new applications, based on the blockchain, might emerge across a range of sectors. Indeed, one can envisage a world in which many activities that have traditionally been formally organized and administered using the technology of bureaucracy will, in the future, be based around some derivative version of the blockchain. The provocative question for us is that if we see bureaucracy as a *technology* that states have relied on—and been constituted by—then will the blockchain and its derivative technologies be a *disruptive technology*, and, if it is, will it work to undermine a state's pillar by providing state-independent authentications?

In a seminal paper, Miller and O'Leary (1987) showed how theories of standard costing and budgeting—which emerged in the first three decades of the twentieth century—were part of a wider modern apparatus of power from that period which worked to refashion the individual person into a more manageable and efficient entity. Their historical study highlighted how

novel accounting practices from the period were deeply implicated in new forms of citizenship, governance, authority and identity. Their study is also a good illustration of how performativity, or the idea that theories about the nature of society and individuals can come to be true in practice, aided and abetted by technologies based on these theories. It appears that something similar is happening with cryptocurrencies and the blockchain, which now promise (and threaten) to undermine our understandings of the state and the individual, as well the responsibilities of one to the other.

3.5. Statistics

A comprehensive discussion of the evolution of statistics from seventeenth century state science to contemporary big data is beyond the scope of this paper. What we want to highlight is how, in recent decades, the finiteness and self-containment of state datasets has been problematized and transformed. To do that, we introduce a mental experiment, by comparing a typical state dataset, such as the birth registry, and a pervasive online dataset like Facebook friends. These two datasets differ in at least three major aspects: longevity, representativity and reliability. First, the birth record must be kept for generations, ideally *ad infinitum*, whereas there is no similar concern about longevity of the Facebook dataset through the next decades. Second, there is the issue of representativity, in that it is assumed that the birth record reflects precisely all the newborns of a country (and makes individual records available to other countries if required) whereas there is no certainty that Facebook friends correspond accurately to people's social relationships. Last but not least, public service records must be reliable. While it is a major problem if a state cannot provide a citizen's birth certificate, this level of data quality is not considered a pressing issue in Facebook.

In spite of those significant differences, information technology multinationals collect and handle data of public relevance and implement policing actions to improve data management. Hence, similar to the way private banks have eroded the state's powers on fiat money by creating their own credit money, IT multinationals are gaining power through managing people's information of public relevance. Moreover, the encounter of these two industries, banking and information, can prove disruptive for the status quo because information about money is money: tracking people's behaviours makes their whole lives much more visible and analyzable, and not only for economic purposes.

Against this backdrop, the blockchain technology envisages and performs an environment where the Leviathan's finiteness does not exist and where no single actor can claim exclusive ownership on its public ledger of transactions. Thus, on its own, bitcoin constitutes a threat to the state as was recognized by the Irish Central Bank's Director of Market Services, Gareth Murphy who, in his address to the 2014 BitFin conference, identified seven concerns that financial authorities have with bitcoin, the first of which related to economic statistics. For him,

The starting point for all economic stewardship is the measurement of activity. Most countries have at least one official statistics agency charged with this responsibility. More widespread use of a virtual currency would mean that statistical agencies would have to gather data on activity in virtual currencies. Otherwise, measures of economic activity would not be complete. We should not underestimate the range of purposes for which national accounting measures are used in the stewardship of economies. In that regard, the completeness and integrity of these statistics is vital. (Murphy 2014)

There are at least three difficulties facing the state's statistical agencies. First, it is not clear how they might engage with the blockchain in a way that is distinctive from the analysis that many private agencies are doing on the data that now resides in the blockchain¹². Second, the blockchain is not designed to be a state-based information infrastructure, nor is it designed to connect with state datasets. Indeed this notion is probably anathema to those who sought to design the blockchain as a technology that would not be connected, in any way, to any state. Third, an important feature of the blockchain is that it facilitates a certain level of anonymity, which will confound the state's aspiration to obtain a complete measure of economic activity. Here, we see the paradigm of finiteness reaching its end point, as economic activity escapes the state's gaze, and, as such activity expands, the state's purview must necessarily contract.

4. Performing the blockchain without a *coup d'état*

In a speech to a 'Gaming Money' workshop held in University College Dublin in May 2015, Nigel Dodd observed that "Any money has an imaginary social order", which raises the question as to the nature of the imaginary social order upon which owners of Bitcoin make a claim. Answers to this question can shed some light on what and how contemporary society prices what it values.

¹² For example, [Quantabytes](#), [CoinAlytics](#), [Bitodine](#), [Coinometrics](#)

The previous section has illustrated how the blockchain and bitcoin seem to work to undermine, at least theoretically, five pillars of the contemporary state. Of course, would be unwise to envisage any imminent collapse as these pillars have a long tradition and robust foundations. Indeed it is ironic that, fifteen years after Strange (1999) wrote about Westfailure, states had to step in—in a massive way—to save those same organizations that were undermining their sovereignty. The nationalization of banks and more generally the intervention of states to rescue organizations deemed “too big to fail” has demonstrated that, while globalization and neo-liberalism might had made states unfashionable and denigrated, they are anything but irrelevant.

Yet, the times do seem to be a-changing, which means that there’s a need and scope for theorizing and new language to make sense of emerging phenomena. For us, Simmel’s notion of *sociability* is particularly helpful, in that it stresses the importance of ‘togetherness’, of being associated with others. The meaning of sociability echoes Tönnies (Tönnies and Loomis 1957/2002) concept of *Gemeinschaft*, which describes a romanticised version of intimate relations exemplified in the community, family and neighbourhood in contrast to the instrumental, rationalist nature of *Gesellschaft* exemplified in the city, the state and the organisation. In digital heterotopia, sociability takes a particular form because here it is not based on community feelings or on social contracts mediated by the Leviathan. Hence, we speak of *digital sociability*, and indeed an emerging research agenda might be focused on empirically describing and understanding this phenomenon and how it is maintained and performed. A framing device for such a project might be the four fundamental models of social ordering identified by Fiske (1991): Communal Sharing, Authority Ranking, Equality Matching, and Market Pricing. While each of these can be readily identified in digital heterotopia, the important questions are the form that each model takes and how the models relate to one another. Communal Sharing occurs in groups that are rather homogenous and tightly knitted (‘all for one and one for all’ neatly captures the idea). A good example of communal sharing is the enclave, which appears to have much in common with digital heterotopia: for instance, both have a strong hostility to those outside the enclave and tend to valorise community consensus. Authority Ranking is characterised by hierarchy and asymmetrical power structures in which subordinates defer, respect and obey superiors. While Bitcoin is designed to be a ‘flat’ organisational structure—the antithesis of Authority Ranking—powerful mining pools have emerged as have concerns about ‘bitcoin dictators’ (Gorale 2015). Digital heterotopia also

appears to be a case of Market Pricing, in that community is structured around the mining of an asset that can be exchanged on a market. In Equality Matching relationships, individuals monitor the balance between give and take among participants and understand what needs to be done to restore balance. In digital heterotopia, this organising model seems less prominent than the others—for instance there are minimal processes through which wrongs might be righted—though again the model provides a potentially interesting lens for studying digital heterotopias.

If the institution of the state is in decline, then anthropological studies of stateless societies, and the ways in which they maintain social order, are likely to be illuminating. For instance, Pitt-Rivers went to Southern Spain after the Second World War to study anarchism, a political position that by definition rejects states and any other formalized authority while advocating free cooperation without heteronomy. His book, *Los hombres de la Sierra* (Pitt-Rivers 1954), became a classic for its originality in explaining a political position as a product of a particular socio-cultural context. The village, as an instance of anarchism, is presented as a “moral unity” whose values are more respected than those coming from outside, such as those derived from the state rule of law or religious authorities. One implication of this is that illicit activities like contraband are not just tolerated but actively protected as an aspect of the community that does not conflict with the community’s sense of morality. Hence, we find a disjunction between the rule of law and justice; when the former is absent, morality becomes the foundation for social order and therefore justice. What this suggests is a focus, both theoretically and practically, on morality and justice in digital heterotopia.

If heterotopian money cannot be defined as a claim upon states, can it still be called a claim upon society? We argue that it can, if we adopt a broader definition of society, not confined by the usual reference to nation-states. Simmel’s concept of *vergesellschaftung* or ‘sociation’ is helpful, because, compared to ‘society’, it is more fluid and even playful in relating to immanent social relations rather than society as an entity existing above the individuals. Hence, money would be a claim upon sociation, i.e. upon the potential and continuous becoming of social relations which might or might not be influenced by value in the shape of money.

Play is central to Simmel’s understanding of sociability—which he sees as the “art or play form association” (Simmel and Hughes 1910/1949: 254)—and it is also central to post-structuralist notions like *différance* and ‘supplementarity’ that seek to speak to the notion that the centre can never hold (Derrida 1972; 1974/1976). These ideas find empirical expression in the case of

Bitcoin, which is not so much a story about a *coup d'état*, but instead operates by deflating the state's finiteness through *différance* (a French play on words that refer both to 'differ' and 'defer'). Bitcoin clearly *differs* from fiat currencies, and its meanings and usages also depend on differences from those practices that constitute other currencies. Bitcoin also *defers* state action by eluding its regulations. From the libertarian milieu where it originated after centuries of state power, Bitcoin's elusiveness is a form of encoded disobedience. But now that Pandora's box has been opened, we can see the far-reaching consequences of a social experiment that has promised to walk the talk of decoupling states and currencies and which now seems to be opening up unintended opportunities for businesses and regulators.

5. Do libertarians dream of electronic money?

Crucially, Bitcoin and the blockchain distrust the notion of trust, and Nakamoto has devised a technology based on the idea that individuals do not trust one another and they certainly do not trust the state or centralised authority. Political libertarians and neoliberals have, to different extents, distrusted the state and are typically hostile to state interference in the affairs of individuals and firms. Digital heterotopia might be a case of those dreams coming true, though it might also be a case of being careful what one wishes for. Trust—in one another and in institutions like the state—is important for the success of social regulation across many domains and for ensuring that individuals and businesses have the confidence to invest, exchange and consume. And far from being the problem, the state has a significant role to play in maintaining and improving a world in which we are happy to live.

The anti-state rhetoric that has fuelled Bitcoin is a routine and enduring feature of popular culture, and is hilariously lampooned in a famous scene in Monty Python's, *The Life of Brian*. In this scene, John Cleese, playing the leader of People's Front of Judea that is plotting a *coup d'état* against the Romans, asks "What have the Romans [the state] ever done for us?" To the many answers provided by his gang of rebels, we can add a twist to Othello's words: the state has done us some service, and we know 't. And neoliberals know 't too.

References

Aglietta, M. and Orléan, A. (1984) *La Violence De La Monnaie*. Presses universitaires de France.
Austin, J. L. (1970) *Philosophical Papers*. Oxford: Oxford U.P.

- Barnes, B. (1988) *The Nature of Power*. Cambridge: Polity.
- Bjerg, O. (2014) *Making Money: The Philosophy of Crisis Capitalism*. London: Verso.
- Bowker, G. C. (1994) *Science on the Run : Information Management and Industrial Geophysics at Schlumberger, 1920-1940*. Cambridge, Mass. ; London: MIT Press.
- Bump, P. (2015) 'How the U.S. Can Arrest Fifa Officials in Switzerland, Explained', *The Washington Post*, May 27,
- Collins, R. (1994) *Four Sociological Traditions*. New York ; Oxford: Oxford University Press.
- Dandeker, C. (1990) *Surveillance, Power and Modernity: Bureaucracy and Discipline from 1700 to the Present Day*. Polity Press Cambridge.
- Derrida, J. (1972) 'Structure, Sign and Play in the Discourse of the Human Sciences', in R. Macksey and E. Donato (eds.) *The Structuralist Controversy*. Baltimore: Johns Hopkins University Press, 247–272.
- Derrida, J. (1974/1976) *Of Grammatology*. Baltimore, Md.: Johns Hopkins U.P.
- Dodd, N. (2014) *The Social Life of Money*. Princeton: Princeton University Press.
- DuPont, Q. and Maurer, B. (2015) *Ledgers and Law in the Blockchain*. June 23rd Available at: <http://kingsreview.co.uk/magazine/blog/2015/06/23/ledgers-and-law-in-the-blockchain/-byline>.
- Eichengreen, B. J. (2011) *Exorbitant Privilege : The Rise and Fall of the Dollar*. Oxford: Oxford University Press.
- Elias, N. (1982) 'Civilization and Violence: On the State Monopoly of Physical Violence and Its Infringements', *Telos*, 1982(54): 134-154.
- Fiske, A. P. (1991) *Structures of Social Life: The Four Elementary Forms of Human Relations*. New York: The Free Press.
- Fletcher, J. (2013) *Violence and Civilization: An Introduction to the Work of Norbert Elias*. John Wiley & Sons.
- Foucault, M. and Miskowicz, J. (1986) 'Of Other Spaces', *diacritics*, 16(1): 22-27.
- Giddens, A. (1985) *The Nation-State and Violence*. Oakland: Univ of California Press.
- Gorale, A. (2015) 'Bitcoin Dictators Inflate Block Size Debate'. *Cryptocoinsnews*. Available at: <https://http://www.cryptocoinsnews.com/bitcoin-dictators-inflate-block-size-debate/> downloaded June 18, 2015.
- Graeber, D. (2011) *Debt : The First 5,000 Years*. New York: Melville House.
- Gupta, A., Sharma, A., Agrawal, A., Bénéti, V., Clarke, J., EcheverriGent, J., Gledhill, J., Hancock, M., Herzfeld, M. and Narotzky, S. (2006) 'Globalization and Postcolonial States', *Current anthropology*, 47(2): 277-307.
- Hardt, M. and Negri, A. (2000) *Empire*. Cambridge, Mass.: Harvard University Press.
- Harvey, D. (1989) *The Condition of Postmodernity. An Enquiry into the Origins of Social Change*. Oxford: Blackwell.
- Harvey, D. (2000) *Spaces of Hope*. Univ of California Press.
- Helleiner, E. (2003) *The Making of National Money : Territorial Currencies in Historical Perspective*. Ithaca: Cornell University Press.
- Hobbes, T. (1651/2005) *Leviathan*. Peterborough: Broadview Press.
- Jemielniak, D. (2013) 'Change, Rebellion, or Else? Wikimedia Movement Governance', *International Network of Business and Management Journals*, (January): Available at: <http://works.bepress.com/jemielniak/25>
- Knorr-Cetina, K. (1981) 'Introduction: The Micro-Sociological Challenge of Macro-Sociology: Towards a Reconstruction of Social Theory and Methodology', in K. Knorr-Cetina and A. Cicourel (eds.) *Advances in Social Theory and Methodology : Towards an Integration of Micro- and Macro-Sociologies*. London: Routledge and Kegan Paul, 1-47.
- Luhmann, N. (1995) *Social Systems*. Stanford: Stanford University Press.

- Marazzi, C. (1995) 'Money in the World Crisis: The New Basis of Capitalist Power', *Global Capital, the National State and the Politics of Money*.
- Marx, K. (1871/1968) *The Civil War in France: The Paris Commune*. New York: International publishers.
- Miller, P. and O'Leary, T. (1987) 'Accounting and the Construction of the Governable Person', *Accounting, Organizations and Society*, 12(3): 235–266.
- Miscione, G. (2014) 'Myth, Management of the Unknown', in N. Campbell, J. Desmond, J. Fitchett, D. Kavanagh, P. McDonagh, A. O'Driscoll and A. Prothero (eds.) *Myth and the Market*. Dublin: Michael Smurfit Graduate School of Business, University College Dublin, 143–168.
- Murphy, G. (2014) 'Address by Director of Markets Supervision Gareth Murphy at the Bitfin 2014: Digital Money and the Future of Finance Conference'. *BitFin 2014*. Dublin. Available at: <http://www.centralbank.ie/press-area/speeches/Pages/GarethMurphyBitFin2014.aspx>.
- Nakamoto, S. (2008) 'Bitcoin: A Peer-to-Peer Electronic Cash System', *Consulted*, 1(2012): 1–28.
- Norman, L. (2012) 'Swift to Cut Ties with Iran Banks after Eu Ban', *Wall Street Journal*, March 15,
- Pitt-Rivers, J. A. (1954) *The People of the Sierra*. London: Weidenfeld & Nicolson.
- Russell, A. L. (2006) "Rough Consensus and Running Code" and the Internet-Osi Standards War', *IEEE Annals of the History of Computing*, 28(3): 48-61.
- Rymarczuk, R. and Derksen, M. (2014) 'Different Spaces: Exploring Facebook as Heterotopia', *First Monday*, 19(6).
- Saco, D. (2002) *Cybering Democracy : Public Space and the Internet*. Minneapolis: University of Minnesota Press.
- Schneider, F. and Kearney, A. (2011) 'The Shadow Economy in Europe, 2011', *Johannes Kepler Universitat, Linz*: Available at: <http://www.atkearney.com/documents/10192/1743816/FG-The-Shadow-Economy-in-Europe-1.png/2db244cd-9989-447c-8499-ea9043c4d0f3?t=1374166115940>.
- Simmel, G. (1900/2004) *The Philosophy of Money*. London: Routledge.
- Simmel, G. and Hughes, E. C. (1910/1949) 'The Sociology of Sociability', *The American Journal of Sociology*, 55(3): 254–261.
- Soja, E. W. (1989) *Postmodern Geographies : The Reassertion of Space in Critical Social Theory*. London: Verso.
- Stallybrass, P. and White, A. (1986) *The Politics and Poetics of Transgression*. London: Methuen.
- Star, S. L. and Ruhleder, K. (1996) 'Steps toward an Ecology of Infrastructure: Design and Access for Large Information Spaces', *Information systems research*, 7(1): 111-134.
- Strange, S. (1999) 'The Westfailure System', *Review of International Studies*, 25(3): 345-354.
- Swedberg, R. (1998) *Max Weber and the Idea of Economic Sociology*. Princeton, NJ ; Chichester: Princeton University Press.
- Swedberg, R. and Agevall, O. (2005) *The Max Weber Dictionary: Key Words and Central Concepts*. Stanford University Press.
- Tönnies, F. and Loomis, C. P. (1957/2002) *Community and Society (Gemeinschaft Und Gesellschaft)*. Mineola, N.Y.: Dover Publications.
- Varela, F. G., Maturana, H. R. and Uribe, R. (1974) 'Autopoiesis: The Organization of Living Systems, Its Characterization and a Model', *Biosystems*, 5(4): 187-196.
- Weber, M. (1921/1978) *Economy and Society*. Totowa: Bedminister Press.
- Weber, M. (1930/2002) *The Protestant Ethic and the Spirit of Capitalism*. London: Routledge.
- Weber, M. (1962) *Basic Concepts in Sociology*. Owen.
- Young, S. (1998) 'Of Cyber Spaces: The Internet & Heterotopias', *M/C Journal*, 1(4).

