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Ulfstjerne, Michael Alexander

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Anticipatory Infrastructures of the Cashless Society

Michael Ulfstjerne

'I'm BoB', his black T-shirt reads. But he's not BoB. He's Simon.[2] In the attempt to gain a better understanding of what drives the recent blockchain hype, I've met Simon along with his colleagues and friends at their shared penthouse apartment in Malta. Simon has a background in information technology engineering and is the chief technical officer of a new start-up that aims for large-scale adaptation of cryptocurrency, namely Bitcoin. Simon is a sworn libertarian and a self-proclaimed 'anarcho-capitalist'. He recently moved from Sweden to Malta, the Mediterranean Island that is gaining increasing attention for its crypto-friendly legislation and outspoken optimism about blockchain-related services and industries. I pay only scant attention to Simon's T-shirt until he and his colleague bring 'BoB' into the conversation. It turns out that BoB is an acronym for 'Building on Bitcoin'. The slogan originated at a grassroots conference held in Lisbon in July 2018, which was primarily oriented towards the technical community that strives to create applications that build on the initial Bitcoin protocol. 'For us', Simon explains, 'blockchain is sort of a bad word.' Simon and his colleague's critique resonates with other voices in the cryptocurrency community who remain sceptical of state

adoption, empty hype, scams and the increasing connivance of powerful financial stakeholders. Bitcoin, however, seems to retain a ring of autonomy and remains a model for people like Simon. In spite of often being confused and used interchangeably, Bitcoin and blockchain may be heading in different directions.

Honing in on the anticipatory infrastructures of a cashless society, this chapter follows the blockchain as it travels from its original use in Bitcoin. What ideological bearings travel with it, what is left behind and what new diverging interests are manifest in the transformation from cash to code? Answering these questions, I draw inspiration from critical writings on infrastructure (see Chu 2014; Harvey, Jensen and Morita 2016; Larkin 2013; Star 1999) as well as recent work on payment systems. Echoing Susan Leigh Star's (1991: 1) early call to take a closer look at 'boring things', I follow recent scholars (Dodd 2018; Maurer 2012, 2017; Nelms et al. 2018: 15, 22; Swartz 2017) who study money's underlying 'rails' and 'pipes'.

Abetted by the incremental loss of faith in fiat currencies and the apparently tireless streak of financial debacles and fraud in existing financial institutions, Bitcoin and its underlying technology, the blockchain, represent alternative visions of money in a digitalised world and have thus helped voice popular concerns over the future of money and the current directions of fiscal policy. As recent research has shown, however, there are limits to the dominant ideals and economic imaginaries of openness, transparency and peer-to-peer (P2P) transactions intrinsic to much debate on cryptocurrencies and distributed ledgers. Nelms and colleagues (2018: 24) observe how the economic imaginary of 'just us' is actively corroborated in the payment industries sector, where a broad line of start-ups, fintech entrepreneurs, and payment professionals invoke the 'social aspects' of payment under the auspices of a peer-to-peer economy (see also Tooker and Clarke 2018). While these emerging

technologies to some extent challenge the status quo of states and banks, they simultaneously position these new agents in their place as 'disintermediaries', paradoxically seeking to 'disappear into the very relations they facilitate' (Nelms et al. 2018: 15).

Taking a point of departure in these insights, the aim of this chapter is to show how not only these 'disintermediaries' but also more conventional intermediaries aim to seize the opportunities offered by the recent blockchain hype. This is particularly evident as states such as Malta opt to become frontrunners in the blockchain industries. The 'just us', in turn, makes evident an eerie cohabitation of agents with widely diverging interests: between the 'just us' of libertarians and cypherpunks like Simon and his peers, the 'just us' of payment professionals and now also the more conventional financial intermediaries.

The arguments put forth in this paper rest upon one year of episodic on- and offline ethnography among investors, programmers and fintech enthusiasts. My research also included reading whitepapers, conducting participant observation in encoded and decentralised social media platforms such as Medium and Steemit and participating in discussion groups on Facebook, Twitter, Telegram and Bitcointalk. The article also draws on two brief research sojourns in Malta before and during the 2018 Malta Blockchain Summit, which was composed of legislators, investors, start-ups, Bitcoin maximalists, day-trading syndicates, lawyers, accountants and blockchain researchers at the University of Malta.

The following is structured into three parts. First, to understand what is at stake in the much-debated shift from 'cash to code', I provide a brief background of blockchain's first use, Bitcoin, before I move on to list other embryonic use cases of the blockchain. Next, to illustrate the above-mentioned divide, I juxtapose Bitcoin with blockchain's *travels* by returning to 'BoB' and the 'Blockchain Island'. Here I relate recent writings on digital

finance's 'relational' and 'social' bearings (Dodd 2018; Nelms et al. 2018; Tooker and Clarke 2018). On these grounds I point to an inherent paradox regarding the contemporary hype: what was initially meant to cut off third parties and intermediaries has seen the proliferation of financial intermediaries, brokers and interests that break with initial tenets of the Bitcoin protocol.

From Cash to Code

To understand the widening gap between Bitcoin's ideological underpinnings and blockchain's present travels, the following briefly recaps two central characteristics of Bitcoin: the idea of obliterating the need for so-called trusted third parties through code and Bitcoin's emphasis on a peer-to-peer economy.

Bitcoin's initial protocol emerged at an auspicious moment: the recession following the 2008 financial collapse, the credit crunch, regional hyperinflation and so-called currency wars (Richards 2012). As a consequence of the increasing loss of faith in existing financial systems—and aided by the ease with which current technology can invent new forms of money—monetary experiments have proliferated. These range from local community moneys such as Ithaca Hours and Brixton Pounds to gaming money like World of Warcraft Gold and ironic money memes like Dogecoin, which suddenly took on unimaginable value as it went viral. Of these alternative currencies, Bitcoin has emerged as one of the most successful in terms of scale, reach and publicity (Dodd 2018: 38).

Behind Bitcoin is the pseudonym Satoshi Nakamoto. Despite myriad attempts at uncovering the identity/ies behind the pseudonym, Satoshi is still engulfed in an air of mystery. While Satoshi's real identity may not be revealed, the thoughts behind the Bitcoin protocol

are readily available on early online discussion forums between pioneers from around the time of its conception. Bitcoin and its most central tenets are also accessible in the whitepaper: 'Bitcoin: A Peer-to-Peer Electronic Cash System' (Nakamoto 2008). As implied in the whitepaper's title, Bitcoin's imagined use recalibrated the anonymity of cash transactions into the digital sphere. Prior to Bitcoin, digital transactions relied almost exclusively on established financial institutions serving as what Nakamoto describes as 'third parties'. He writes,

> What is needed is an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party. (2008: 1)

One of the challenges that Bitcoin is trying to address is the problem of double spending in digital payments. In other words, how to make sure that one coin has not been spent multiple times. This is where a third party usually comes in to protect transactional parties from fraud and the identities of the transacting parties. This 'protection' nevertheless allocates substantial power to these third parties, primarily by making stored information about parties exposed to hacks, leaks, governments' requirement of data disclosure and so on. Nakamoto solves this problem by giving every transaction a timestamp and making all transactions publicly available in a comprehensive audit trail that is openly accessible to everyone. So-called public keys act as accounts in the network, yet by 'keeping public keys anonymous' (Nakamoto 2008: 6) the Bitcoin protocol doesn't disclose the identities of the parties in a transaction, making it more akin to peer-to-peer cash transactions.

The transition to Nakamoto's 'electronic cash system' is premised upon making two aspects of monetary trust redundant. First, through an 'algorithmic control of the

money supply' (Maurer, Nelms and Swartz 2013: 273), it does away with the need to trust that central banks execute a responsible fiscal policy. Second, as stated in Nakamoto's quote above, Bitcoin is designed to obviate the need for trust between transactional parties through cryptographic proof—that is, a particular system of verification.

A payment can be thought of as a digital message. Once you make a transfer of funds, the digital message is translated into a long line of numbers and letters called a 'hash'. It is then sent out into validation nodes in the network, popularly called 'miners'. A central feature of Bitcoin is that every computer on the entire network registers every single transaction in the ledger. Miners update the ledger by gathering all encrypted messages, duplicating the entire record and employing computational power to authenticate the transactions.[3] Each transaction is stored in a block and each block becomes part of the chain. In this sense, Bitcoin is at once a currency and its underlying 'rails and pipes'.

Bitcoin, however, is only one of several possible applications that blockchain enables, and it is important not to conflate the two. The blockchain is an example of a distributed ledger technology (DLT) in which there is no authoritative account holder or central location for data storage. Given that the blockchain, in principle, cannot be altered or tampered with, the ledger takes on the function of a collective database or transactional archive. But not only economic transactions like in the case of Bitcoin but also many other kinds of information (contracts, records, personal data, etc.) are potentially processed and verified through a network of distributed computation. A quick glance into the cryptocurrency sphere provides plentiful examples of the diverse uses that blockchain serves beyond financial P2P transactions termed 'privacy coins'. Other examples include use-tokens that are similar to limited-use coupons. Blockchain is also supposedly curbing

the circulation of counterfeit commodities by archiving the biography of luxury items, high-end consumer products and cars. Other industries prone to be 'disrupted' by the technology include supply-chain management, real estate, creative content sharing, advertisement, transparent electoral and public opinion systems, P2P remittance transaction systems, payment user systems, renewable and green energy and miscellaneous variants of Bitcoin like PotCoin, HashCoin, SpankCoin, JesusCoin and PonziCoin. With more than two thousand[4] different tokens and coins listed at the moment of writing, the list could be made longer. In the case of many of these embryonic use cases, the technological infrastructure is not singularly premised on openness and transparency. Both permissioned and private blockchains exist, in turn countering central ideas in the Bitcoin protocol.

Besides the ever-expanding numbers of tokens and coins, one needs simply to consider banks' quick adoption of the technology. Already in 2015, the head of the Federal Reserve Bank of St Louis, David Andolfatto, expressed openness to offering digital and even cryptocurrency money services at retail and wholesale levels (Andolfatto in Birch 2017: 188).[5] A recent report on monetary policy in the digital age issued by the International Monetary Fund posits that cryptocurrencies may prove capable of reducing demand for central bank money, given that ongoing technological innovation succeeds in addressing current deficiencies (He 2018).[6] Scepticism towards such a transition, however, remains widespread, and a survey of legal landscapes around the world show the widely disparate nature of national policy, which ranges from criminalisation and bans to regulation and adoption of the technology.[7] Clearly, blockchain's role in the future of money is found not only at the frontiers of technology but also in the rhetoric of state leaders. Nations such as Venezuela, Russia and Azerbaijan are launching their own cryptocurrencies and blockchain uses, and smaller jurisdictions are

competing to become the most attractive locations for blockchain-related industries.

BoB and the Blockchain Island

Within the last year, Malta has placed itself on the map of aspiring blockchain-friendly jurisdictions. In a speech at the UN General Assembly on 27 September 2018, Malta's prime minister proclaimed that cryptocurrencies make up the 'inevitable future of money'[8] and that the blockchain will help bring about a more transparent and equal society. Muscat's speech resonates with Malta's recent rebranding of itself as the 'Blockchain Island' and have taken serious steps to regulate what has up until now been considered a speculative Wild West frontier and a regulatory no man's land. At his keynote address at Malta Blockchain Summit, 1 November 2018, Prime Minister Joseph Muscat expressed Malta's ambitions in the succinct terms:

> This is the land of opportunity for blockchain. . . . The seed landed on very fertile soil, and as a government we saw the opportunity to start watering carefully the seed to make sure that it grows in an organic way, yet building the blocks around it to make sure that when the time is right it starts bearing fruit.[9]

Modelled on its economic success as a leading jurisdiction in the I-gaming industries, Malta is embarking on creating on what local, Maltese stakeholders refer to as an 'ecology' for blockchain development. But what does this 'ecology' comprise?

First and foremost, it entails a comprehensive legal framework. On 4 July 2018, three bills were passed in the Maltese Parliament and are among the first steps taken to regulate cryptocurrencies, blockchain, and distributed

ledger technologies. The three bills are the Malta Digital Innovation Authority Act (MDIA), the Innovative Technology Arrangement and Services Act (ITAS) and the Virtual Financial Assets Act (VFA). The first (MDIA) relates to the instalment of a new authority responsible for regulating the technology sector in a way more aligned with the new competences needed. The second (ITAS) sets out a framework for the registration and auditing of new 'technology arrangements', such as DLTs, smart contracts and related applications. Through this legal architecture, the so-called decentralised autonomous organisation (DAO) exists to obtain rights and responsibilities just like other registered companies. Finally, VFA's main purpose is to create a legal architecture aimed at auditing initial coin offerings, digital wallets and cryptocurrency exchanges. This will not be done directly by the authority itself but by VFA agents. Servicing the anticipated influx of start-ups, several hundred certified VFA agents, also called prospective agents, of chiefly advocates, accountants and auditors, are set to act as a new kind of intermediary between 'prospective clients' (i.e., the companies) and the new financial authority of the Malta Digital Innovation Authority Act (MDIA). In addition to the legal architecture, education plays a central role. The University of Malta is launching cross-disciplinary courses for blockchain-related industries. Finally, the thriving community of blockchain and cryptocurrency start-ups is further incentivised to set up shop in Malta through a competitive tax regime. The new legislation took effect on the same day that Prime Minister Muscat delivered his keynote address at Malta's Blockchain Summit, concluding, 'We are open for business [and] now have a playing field designed: touchlines, goal lines, goalposts and flags. We are now inviting people to come and play in our field. . . . Our philosophy is to be honest brokers to know where we all stand with each other'.

Back with Simon and his peers, we talk about BoB and the increasing divide between blockchain and Bitcoin.

Blockchain wasn't always a bad word, Simon explains. Now, at tech-community meet-ups, when someone says 'blockchain', they go to great lengths to excuse even using the term. As a response to the recent buzz of 'blockchain, not Bitcoin', Simon and many like him frown at the blockchain hype: 'In my view, coming from the technical side of things, the blockchain itself is just a piece of the puzzle. Not even the most important one. . . . So we have this piece of technology that is very slow. It has very little capacity. It's like a database, but a very bad database. . . . It's something that we need because we can't do it [distribute the ledger] any other way'.

A few months earlier, the young entrepreneurs set up Malta's first two-way cryptocurrency ATM that enables customers to buy Bitcoin with fiat and, conversely, to change Bitcoin to Euro. In spite of its pronounced blockchain ambitions, Malta is cash driven, and ATMs make up a considerable part of the island's monetary infrastructure. Simon and his colleagues therefore reasoned that a Bitcoin ATM was a way to build a bridge between cash and fiat money and, in that way, push for more mainstream adoption of Bitcoin. While working hard for their own start-up to thrive, both Simon and his cofounders depend on other sources of income. While some sources of employment relate directly to cryptocurrencies and blockchain-related industries, others include remote accounting jobs and programming. Despite the pronounced divide, Simon and his peers nevertheless seem to retain some optimism about Malta's recent steps towards legislation. They hope it will take shape in a way that helps start-ups and cryptocurrencies flourish and, moreover, that there will be broader adoption of Bitcoin by local businesses.

The distinctions, hopes and dedicated labour found within the Bitcoin community alerts us to Bitcoin's political and affective undercurrent, which goes beyond innovation in payment technologies. As Maurer and colleagues write, 'Bitcoin is meaningful and valuable not so much

as an actual complementary or alternative currency, but instead as an index of much broader discussions over the nature of money, credit and capital in the world today. . . . The point is not whether Bitcoin "works" as a currency, but what it promises: solidity, materiality, stability, anonymity, and, strangely, community' (2013: 263). Sociologist Nigel Dodd takes this idea even further, pointing to an inherent paradox that lies at the heart of Bitcoin—that is, that if it succeeds as money, it will necessarily collapse as ideology. Despite its emphasis on obliterating the need for trust or social relations through code, Dodd (2018: 37) argues that the Bitcoin network thrives exactly because of its strong community and, therefore, essentially despite and 'not *because of*, its reliance upon machines'.

'BoB' and its tightknit community of libertarians, cypherpunks and anarchists might well still benefit from the recent blockchain hype by way of their technical knowledge, the more 'friendly' regulatory environment such as that offered in Malta as well as social networks that increasingly connect with traditional intermediaries. But whether the 'the world of Bitcoin' (Maurer et al. 2013: 262) will continue to be composed of heterogeneous interest groups is largely an open question that depends to a great extent on the ongoing contentions over the anticipatory infrastructures of the cashless society.

Conclusion—If Not Just Us, Then Who?

In a recent article on the nature of money as record in distributed accounts, Bill Maurer asks, 'Can there be a democratically decentralised database, owned by none or owned by all, without the intercession of any scribes, bookkeepers, banks, or governments? Just how far can the distribution of agency go?' (2017: 112). While many voices in the Bitcoin community certainly seem to believe in the credo of a democratic and flat peer-to-peer network

with no intermediaries, the emerging blockchain 'ecologies' suggest otherwise, as states compete to become 'honest brokers' and provide 'a fertile soil' for cryptocurrencies and decentralised organisations. In this regard, the predominant imaginaries of decentralisation and the peer-to-peer economy come across as increasingly contradictory constructs. Such imaginaries are not only actively corroborated by fintech 'disintermediaries' but also fraught with the sedentary and territorial ambitions of aspiring blockchain nations. Against this background the 'just us' expands to include a new line of 'prospective agents', lawyers, advisors, managers, marketing agents, accountants and so on. Returning to the initial question, the blockchain travels light in the sense that it does not automatically reflect Nakamoto's ideological bearings, often held to be critical of nation-states, banks and conventional intermediaries. Nevertheless, in spite of their seemingly contradictory nature, these imaginaries prove resilient—for now, at least.

Bitcoin represents an ambiguous figure in the current race towards a cashless society: while governments such as Malta and even central banks largely endorse Bitcoin's underlying technology, the blockchain, they simultaneously go to great lengths to condemn and curb Bitcoin, just recently coined as 'the evil spawn of the financial crisis' by an executive board member of the European Central Bank, Benoît Cœuré.[10] As implied in the above, however, this may be less than black and white. Agents with widely disparate political interests coinhabit the same spaces and gain from the expectations of wide-scale adoption. But wherein the real disruptive innovation lies is less clear: 'Bitcoin, not blockchain' as Simon believes, or vice versa, 'blockchain, not Bitcoin'.

Present scholarship has brought critical attention to the mundane things of payment technologies and their ideological formations. The archives of economic transactions and historical money forms are consulted to shed new light

on infrastructural innovations and monetary policy. Less attention, however, has been given to growing blockchain 'ecologies' and the ongoing negotiations between central stakeholders in the field. Attending to these ecologies—including the 'anarcho-capitalist' 'BoBs' as well as their sedentary 'broker' twins, I argue—may help avoid *a priori* ethical divides and deepen our understanding of how such cashless ecologies take shape and with what implications.

Michael Alexander Ulfstjerne has a background in anthropology and is currently an assistant professor at the Department of Politics and Society, Aalborg University, Denmark. Ulfstjerne's research focuses on the emergence of new economies and its spatial effects. His publications cover diverse topics such as architecture, spatial planning, humanitarian innovations, economic booms and busts, and the field of alternative currencies.

Notes

1. 'BoB' is an acronym for 'Building on Bitcoin', a slogan coined at a developer community meet-up in Lisbon, 2018.
2. In reality, he's not Simon either. Apart from public figures, I use pseudonyms throughout the chapter.
3. To create incentives for miners who are essentially nodes in a network to 'stay honest', miners obtain a credit line in the Bitcoin ledger (Nakamoto 2008: 4). In other words, they receive a bit of Bitcoin for their efforts.
4. Information retrieved from www.coinmarketcap.com, 10 November 2018.
5. More recent discussions within the Bitcoin community does not entirely exclude the existence of central banks but instead considers the opportunity of 'Bitcoin-backed banks', in turn rendering Bitcoin as a form of 'high powered money' that acts as an underlying reserve currency for central banks (Finney in Ammous 2018: 209–210).

6. Dong He, 'Monetary Policy in the Digital Age', *Finance & Development* 55, no. 2 (June 2018). www.imf.org/external/pubs/ft/fandd/2018/06/central-bank-monetary-policy-and-cryptocurrencies/he.htm.
7. 'Regulation of Currency around the World', The Law Library of Congress, June 2018, www.loc.gov/law/help/cryptocurrency/cryptocurrency-world-survey.pdf.
8. Joseph Young, 'Malta PM at UN General Assembly: Crypto Is the Inevitable Future of Money', CCN, 30 September 2018, www.ccn.com/malta-pm-at-un-general-assembly-crypto-is-the-inevitable-future-of-money/.
9. Fieldnotes from Malta Blockchain Summit at the InterContinental Malta, 1 November 1 2018.
10. Benoît Cœuré made his statement at the Economics of Payments IX conference, November 2018. For the entire talk see Nikhilesh De, 'ECP Official Calls Bitcoin "Evil Spawn of the Financial Crisis"', Coindesk, 16 November 2018, www.coindesk.com/ecb-member-praises-blockchain-potential-in-central-bank-use.

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