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Thwarting an Uber Future for Complementary Currencies: Open Protocols for a Credit Commons.

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Abstract

The paper explores the rationale and potential for practitioners in both complementary currencies and platform cooperatives, and their associated researchers, to consider the role of open protocols to grow the digital commons and avoid a digital dystopia of platform monopolies. The authors contend that there have been two parallel worlds of practice that have hitherto had little interaction. One the one hand, the largely capitalist-backed fields of cryptographic currency innovation and blockchain development, and on the hand the more community-oriented initiatives with older, less technological complementary currencies. Through a literature review, the same rift is shown to extend to academic literature. The authors suggest this division reflects a more philosophical divide between capitalist interests and those seeking to generate and maintain shared wealth. Based on that analysis the relevance of the concept of “the commons” is discussed, as well as the “digital commons” as a way of framing different approaches.

The importance of developing open protocols in order to create conditions for new entrants to thrive, including “protocol cooperatives” is explained. The argument that a free market in privately-issued currencies would naturally avoid monopoly, without conscious effort to do so from innovators and regulators is rejected. Instead, the concept of the commons is applied to currencies and credit, with implications for the development of open protocols for complementary currencies. The vision, strategy and roadmap of the new Credit Commons Collective is presented. The methodology for the research is an adaptation of “reflective practice” through a structured use of “thinking partnership” over the years of engagement with the subject matter, complemented with periods of academic literature review, including for this paper.

Keywords: Cooperatives, Commons, Sharing Economy, Blockchain, Cryptographic

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Matthew Slater started authoring open source software for community currencies in 2007 and cofounded Community Forge in 2008, since when he has maintained the Community Accounting module and the Hamlets Distribution for Drupal. In 2012 he developed the trading floor game with Sybille Saint Girons. In 2015 he developed the Money & Society MOOC with Jem Bendell. In 2016 he co-authored the Credit Commons white paper with Tim Jenkin. He works full time on complementary currencies and lives largely from gifts and hospitality around the world (www.creditcommons.net)

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Introduction

This paper outlines a rationale for growing a “digital commons” of open protocols and related tools for both platform cooperatives and complementary currencies. It documents findings from 7 years of joint reflective practice and related interdisciplinary study by the two authors, one a professor in management studies and the other a complementary currency engineer.

The paper contends that there have been two parallel worlds of practice that have hitherto had little interaction. On the one hand, the largely capitalist-backed fields of cryptographic currency innovation and blockchain development, and on the other hand the more community-oriented initiatives with older, less technological complementary currencies. We find the same rift extending to academic literature, and conclude that the division reflects a more philosophical divide between capitalist interests and those seeking to generate and maintain shared wealth. We note that the field of commercial barter, or reciprocal trade, has received even less attention from researchers, though this may be about to change.

We explore the use of the concept of “the commons” and in particular the digital commons as a way of framing these different approaches. We chronicle the rising concern about multinational corporate domination of the new sector where people rent access to their assets, such as ride sharing or home sharing. We warn that the response to this concern by creating “platform cooperatives” could be flawed, and explain the importance of developing open protocols in order to create conditions for new entrants to thrive, including “protocol cooperatives”. However, we warn that unless more emphasis is placed on developing open protocols within the field of complementary currencies, then this field can be overtaken by multinational enterprises in ways that will make monopolistic practices in the “sharing economy” look insignificant. In doing so, we reject the argument that a free market in privately-issued currencies would naturally avoid monopoly, without conscious effort to do so from innovators and regulators. As innovators, not regulators, we outline how the concept of the commons can be applied to currencies and credit, and introduce the vision and strategy of the new Credit Commons Collective. A roadmap of the next steps for this Collective is presented.

Parallel Worlds of Practice: The Context for Inquiry

In 2013 Bitcoin came to the attention of the world’s media. This private digital currency was being purchased for over 30 dollars and making some people very rich. That meant some of the specific benefits of the technology began to be discussed as well as the very idea that one could create a currency. In 2014, one of your authors initiated the process for the University of Cumbria to become the first public university in the world to accept the currency for payment of fees. For a short period he was being called “Professor Bitcoin” and discussing the currency in mainstream media. We welcomed the attention brought by Bitcoin to the phenomenon of money, and it provides an importance context for the arguments we present in this paper.

Bitcoin is the name simultaneously for a protocol, a digital token, and a torrent network which comprise a distributed payment system which has never been hacked. The system is sometimes called “trustless” because it allows no credit, and monetary policy is done with an algorithm rather than by humans. Despite high volatility Bitcoin's market capitalisation has risen from 0 at its launch in 2009 to around \$20Bn at the time of writing. While its original impulse was a libertarian desire to obviate banks, its main use at the time of writing seems to be helping Chinese millionaires evade capital controls (Redman, 2017).



Since Bitcoin shot to fame a range of other cryptographic currencies have been launched, whether through forking the Bitcoin code or using new code. Bitcoin itself is merely the first application and herald of a family of technologies called blockchains. A blockchain is a cryptographic database which is periodically updated with the addition of a block of the latest items. The new block contains the hash (like a unique thumbprint) of the previous block, so that all the blocks form a continuous chain. A blockchain therefore has a consensus mechanism to decide what the new block is. In recent years blockchains have grown in popularity, as major venture capital has been put into start-ups that seek to apply a blockchain solution to different activities, from running a stock market to registering the flow of goods. Whether a distributively-managed database is the important factor for the services that many of these start-ups are focusing on remains in question.

Sadly, our attempts to mine bitcoin on laptops in India in 2009 were not productive. But our interest in currency innovation pre-dated Bitcoin and our motivation was not to earn money for nothing. Instead we were working in the field of “complementary currencies.” Though numerous examples can be found in history, the modern complementary currency movement really began with the publication of the LETSsystem design manual and the popularisation of Local Exchange Trading Systems (LETS) amongst individuals in the West in the late 1980s (Lietaer, 1999). Another surge of interest came with Edgar Cahn's formulation of Timebanking in the late 1990s, which focused much more on service delivery and mutual support of the poor. Then about seven years ago the model of local vouchers came to the fore, with examples including the Brixton Pound and the Bristol Pound in the UK, which are bought with national currency (Bendell and Greco, 2013).

Today, in the non-profit sphere there are six main networks, some serving exclusively timebanks (Timebanks USA, hOurworld, timeoverflow.org), and some aimed mostly at LETS (German tauschreise, Community Exchange Systems (CES), and Community Forge). CES comprises 4 subnetworks, each running on different machines with different governance. Together these systems are servicing tens of thousands of people who transact with each other regularly. They are very different to both the cryptographic currencies like Bitcoin, and the local vouchers like Brixton Pound, because the currency is issued into circulation as a credit, or IOU. They are “Collaborative Credit Systems” (CCS), which “involve participants monetizing their trust in each other by creating new agreements and symbols concerning exchange of value” (Bendell et al, 2015, p 5). They are described as collaborative, as they involve “voluntary collaboration between people and organizations, rather than compulsory arrangements between banks and governments, to issue and transact credit” (Bendell et al, 2015, p 9). Over the past 15 years, many of these complementary currencies systems have been migrating off their spreadsheets and bespoke web applications and onto a handful of online platforms (Slater 2010). Usually the software is offered as Software As A Service (SAAS), but sometimes can be downloaded and run autonomously, and occasionally hosted by a third party. It is these web applications and their networks of users they support which are critical to the future growth and shape of this sector.

Another form of CCS exists between businesses. In most countries the commercial barter or reciprocal trade sector exists and enables participating businesses the option to trade with each other without using the national currency or banks. At present, the world leader in this sector is Bartercard, a UK listed company with franchises all over the world. Several other networks survive in that market especially in USA (Bendell et al, 2015).

Having inhabited this sector for some years, its fragmentation is painfully obvious to us. There are social spaces such as Thinkbarter for the commercial barter systems, Digital Currency Council and various corporate conferences for digital currency entrepreneurs, and a Skype chat for the community-focused activists, but vanishingly little cross-pollination. In particular, people interested

in cryptographic currencies and the Blockchain on the one hand, and community-oriented non-profit currencies on the other, have not had systematic means of learning from each other.

As practitioners and researchers in this field we are asking: how can there be a step change in the use of complementary currencies in ways that promote positive social outcomes? Therefore, we ask: what might the parallel worlds learn from each other? Not necessarily to collaborate, but to generate new questions and ideas.

Research Methodology

The paper is informed by a blended methodology of 7 years of joint reflective practice by the two authors. Reflective practice is the ability to reflect on one's actions, emotions and thoughts in a professional area, to engage in a process of continuous learning (Bolton, 2010). While experience alone does not necessarily lead to learning, a conscious desire to learn through reflection can produce important knowledge, especially when structured with processes intended to identify knowledge outcomes (Cochran-Smith and Lytle, 1999; Loughran, 2002). The structure for our reflective practice is the well-known notion of a "thinking partner," which in our case involved 8 years of bilateral dialogue, correspondence, periodic data gathering, co-writing and public sharing with a professional peer. Other persons were important thinking partners during this time, but as not constant or as focused on clarifying and applying learning. A particularly important stage and process in our thinking partnership was the creation of a Masters-level mass open online course (MOOC) on Money and Society. The development of a course is recognised in educational theory as a key process for reflective practice, as it involves clarifying and structuring knowledge so it can be shared in sequence with others (Morais et al, 2001).

Reflective practice is now more widely recognised in academia as an important way to bring together theory and practice; on the one hand, through reflection a person can see and label forms of thought during their practice, while on the other, a person can explore the relevance of different theories and concepts for practice (Bolton, 2010). Though multi-year "thinking partnership" is not widely recognised as a method within reflective practice, the role of coaches and mentors is increasingly recognised (Wadsworth, 2010).

This paper does not document the steps in the learning achieved through our thinking partnership, or the published artefacts from the process (e.g. Bendell and Slater 2012), but communicates some important conclusions from our method. We focus on communicating insights about current trends and the potential negative and positive implications of these. Our method is well suited for that, as the empiricist emphasis of mainstream research in most academic disciplines leads to an inability to mesh together multiple factors to make predictions on social systems. Predictions are therefore restricted to narrow factors in the near term rather than broad social matters over longer time frames. An empiricist emphasis also leads to a reluctance to make normative judgements on those predictions. As such, research can be woefully irrelevant to people who seek to shape the future for the better during turbulent times. Unfortunately, a very limited notion of academic knowledge and rigour persists in many disciplines today, along with their relevant journals and conference organisers. This leads to expectations for tightly defined hypotheses, data, analysis and results, rather than more exploratory or multi-faceted forms of inquiry.

We do recognise that the academic discipline of futures studies, or futurology, supports inquiry and commentary on possible futures, and is not something we have studied closely in forming our views of the future - something we may address in our future research (Collier and Fuller, 2005).

Parallel Worlds of Research: Literature Review in Established Disciplines

The parallel worlds of practice in capitalist-invested digital currency or “sharing economy” commercial enterprises on the one hand, and social movement oriented complementary currencies and community exchange on the other, is also reflected in the academe. Since its inception in 1997, the specialist International Journal of Community Currency Research (IJCCR) has shared pioneering and inter-disciplinary research on currency innovation. While it has played a unique role in analysing recent innovations in complementary currencies, developments with cryptographic currencies, blockchains and multinational ‘sharing economy’ firms had been overlooked, at the time of writing. There is also very limited attention to the commercial barter sector, also known as “reciprocal trade”.

Meanwhile, a literature review using databases of academic journals shows that articles in the IJCCR have not gained attention from research published in leading journals in disciplines that relate to the topic, such as development studies, management studies, political science, law, sociology, geography or economics. That is even now, when currency innovation has begun to appear as subject matter in established academic journals, as we will now demonstrate in this literature review.

Currency innovation presents a range of implications for economy and society. Therefore, one can expect various disciplines to research the topic in future. A 2016 search of databases of academic journals in the disciplines of business, accounting, finance, economics, law, sociology and international relations generated less than 30 results of academic papers paying any attention to currency innovation, indicating limited attention to the topic. Though probably not exhaustive, an overview of these publications gives some indication of how traditional academia is beginning to engage.

Though a range of papers within computing research explore the technical aspects of cryptographic currencies (Alam et al, 2015), the broader implications would best be explored within other disciplines. The management studies academe has been encouraged to engage, with the prestigious *Academy of Management Journal* publishing a special editorial to invite more research on currency innovation (Dodgson et al, 2015). They articulated the multifaceted implication of currency innovation, in order to stimulate the creativity of management researchers:

"Money lubricates economic activity. It is also a deeply sensitive social and cultural issue for society, organizations, and individuals. Changes in the way money is created and used cannot be separated from its economic, technological, social, political, cultural, historical, religious, and ethical contexts. Digital money is in its early stages of development, and these complex and interrelated contextual factors will influence its future direction and adoption, adding to the unpredictability of its trajectory of adoption and influence." (ibid, p. 330)

Ahead of the curve, some management academics have provided general overviews in lesser journals (Yahanpath and Wilton, 2014) and guidance for how to teach business students about currency innovation (Barrea, 2015). The sub-discipline of business ethics has begun to see discussions of the pros and cons of Bitcoin from different ethical theories, though without commenting on the ethics of mainstream monetary systems (Angel and McCabe, 2014; Dierksmeier and Seele, 2016). The field of Corporate Social Responsibility is more open to systemic critiques about money and implications for business-society relations (Bendell and Greco, 2013; Bendell and Doyle, 2014). Meanwhile, academics in accounting have realised there are

interesting implications from Bitcoin for financial reporting (Smith and Weismann, 2014; Grant and Hogan, 2015).

Some accounting research can become philosophical and sociological, due to the money being a social construction. It is understandable therefore that research at the cross-over of management and sociology is looking at the dynamics that give bitcoin any “value” (Dalal, 2014; Popescu, 2014; Bjerg, 2016). There is clearly great potential for social theory to cast critical light on cryptographic currencies, their users and regulators (Dodd, 2014). International development studies is a subject area that is used to interdisciplinary studies with practical relevance, so one would expect research papers. However, only a couple were found, published by the UN Research Institute for Social Development (Bendell et al, 2015; Scott, 2016)

Economists have begun to provide broad overviews with reflections on what cryptographic currency may mean for the institution of money (Malovic, 2014; Weber, 2014; Richter et al, 2015; Egorova and Torzhevskiy, 2016). Others have used it as a case study for analysing currency behaviours (Rogojanu and Badea, 2014) or as a way of observing regulators from an economics standpoint (Sauer, 2015). As cryptographic currencies like Bitcoin clearly raise new questions for regulators, there are a range of studies in legal journals (Bollen, 2013; Kien-Meng, 2014). In these articles, we did not see a focus on competition law, or the potential for monopolies to emerge in the field of digital currency, which is something we consider a major oversight and address in this paper, albeit from a strategic innovation standpoint rather than legal studies.

With few exceptions (Bendell and Greco, 2013; Bendell and Doyle, 2014; Bendell et al, 2015; Dodd 2014; Scott 2016), the research just summarised does not look at those innovations in complementary currencies that have not been backed by venture capital and they do not cite the research from the interdisciplinary niche of the IJCCR. Reading such articles, one could be left with the impression that currency innovation did not exist before Bitcoin was invented in 2009. With the founding of the Research Association on Monetary Innovation and Complementary and Community Currency Systems (RAMICS), we may now see further exploration of these topics within traditional disciplines, and perhaps more cross fertilization of ideas between the parallel worlds of practice as well.

The implication of this literature review for the joint reflective practice of your authors is twofold. First, the rift between work on commercially attractive innovations and more grassroots non-profit innovations means that important questions are not being asked of either. That includes what complementary currencies could learn from cryptographic systems, and vice versa. Second, that the academe does not yet provide a credible framework for informing research questions on matters of currency innovation, and therefore the “thinking partner” method we are using is suitable for such a fast moving and under-researched field.

The Commons as a Normative Conceptual Framework

The rift we have described within professional sectors and academic interests between capitalist-backed ventures and community-based initiatives, maps well onto the fundamental rift between private and common resources identified for over a century in studies of political economy. For instance, Karl Marx (1867) talked about 'control of the means of production' as the essential political power that the workers needed to wrest from the owners of capital. Traditionally this rift has been equated to a left/right political axis, and the alternative to capitalist forms of ownership often assumed to be state ownership (Harvey, 2014). However, one thread to the Left tradition has always seen the development of cooperatively-owned enterprise as an important (Alpowitz, 2013).



In recent years, there has been growing attention to this perspective on alternatives, and the conceptual framework increasingly used is “the commons” (Kostakis and Bauwens, 2014)

Commons are widely understood as any sets of resources that a community recognizes as being accessible to any member of that community to the extent that the member abides by certain rules on use. Commons include cultural and natural resources. The most widespread instance of a common is the public right-of-way, or public roads. Commons are public goods. They are most often a finite but replenishable resource, which requires responsible use in order to remain available. Some commons require not only responsible use but also active contribution from users, such as a school or church funded by local donations (Ostrom et al, 1999). We emphasize a whole systems perspective, where a commons is best viewed as a system of resources and people that interact with the tendency to enable continued access for all. For instance, the physical Village Green is not a commons, but a piece of land. It becomes commons because of the system of interaction with it that has a tendency towards continued use by all, for the purpose of sustaining a community. The act of transferring resources from the commons to individual ownership is known as "enclosure."

The concept has been used to describe approaches and systems in technology, as the “digital commons” (Bollier, 2008), with one of the most famous examples being Wikipedia. Consciousness of the importance of ownership and control has grown in recent years as the initial excitement around the sector dubbed “sharing economy,” “collaborative economy” or “access economy” has evolved into concern about the potential for large multinationals like Airbnb and Uber to exploit their dominant market positions (Ertz et al, 2016). A closer look at the investment strategies of many Silicon Valley entrepreneurs helps explain the plans of technology firms. Peter Thiel is the founder of Paypal, on the board of Facebook and invests in a range of technology and financial services firms around the world. "If you want to create and capture lasting value, look to build a monopoly" is the subtitle to his essay for the Wall Street Journal (Thiel, 2014). He explains his investment strategy is to find firms with the potential to establish monopolies. He argues that monopolies are good for society because the outsized profits from not having price competition is a large enough incentive for investors to fund risky innovation. He makes a comparison with the monopoly position allowed for pharmaceutical companies during the period of their patent, to argue that society benefits from monopolies (Thiel, 2014). His argument ignores the short-term nature of a patent and the many problems from monopolies – specifically that all other stakeholders in a monopolist company have little power over its management or investors. Consumers pay more, workers have no alternatives, and governments fear restriction of service if they regulate more. If the public benefits of innovation and efficiency from competition is a key public justification for capitalism then monopoly capitalism appears illegitimate (ref).

One response to a concern about the direction towards monopoly from innovators is “platform cooperativism,” which is the notion that the digital means of production, the platform, should be owned, governed and enrich the value creators participating in it. It is a simple extension of the original cooperativism of the 19th Century, as an approach and as a tactic, into the digital age and cyberspace. The debate about platform cooperativism has usefully brought attention to questions of property ownership and governance, and generated discussions of what the commons might involve in the digital age. However, the history of cooperatives means that we do not have evidence for optimism about the potential of platform cooperatives to effectively compete with their capitalist rivals nor the potential of platform cooperativism to affect the wider economic system. On the one hand, the cooperative movement has demonstrated clearly that cooperatives work as a form of organisation (Lewis & Conaty, 2017). However, as a strategy for social progress, it has been tried by social movements around the world for over a hundred years, and has yet to overcome its antithesis; capitalists. That limited success invites us to consider more work on the very operating system of the economy, and how it might be “commonified” (Bollier, 2008). Our two

proposals for future strategies in developing and protecting the digital commons involve the development of open protocols and the application of commons principles to digital currencies. We now explore each area in turn.

Learning from Open Protocols

When new technologies emerge in a free market, it is normal for each technology innovator to develop their protocols linking new subsystems to new and existing subsystems. As the sector matures, some innovations die out, and a clear winner may emerge. For example, all personal computers use the x86 chipset since 2006 when Apple decided there was no benefit in competing at the level of chip-architecture, and switched from using the superior Motorola chip to the cheaper x86 chip used in the majority of PCs.

Sometimes the market does not deliver a clear winner, and each competitor continues investing in its own infrastructure. In natural monopoly situations, or other situations where interoperability would bring a commercial advantage, the market leaders usually come together and agree on a standard. The universal Serial Bus (USB) was created with such a collaborative process, replacing a plethora of standards and cables and ports and PCI cards.

A protocol is like a language, convention, or standard and as such, use of it cannot be restricted, prevented or monetised any more than use of a word, gesture, or social code. The Internet is essentially a set of protocols (such as TCP/UDP, http, HTML), which leads to a fundamentally more democratic infrastructure. That need not have been so: in a parallel universe, Microsoft R&D invented the web and now every page is a visual-basic-enhanced word document, MS Office is the only tool for authoring them, and it costs \$5000 for a licence and still look wrong on Firefox!

The open protocols avoided that particular dystopia and in the early days provoked a great deal of optimism about how the new freedoms implicit in the Internet would be the basis for a new kind of society. For instance, we recall one declaration in 1996:

“We are creating a world that all may enter without privilege or prejudice accorded by race, economic power, military force, or station of birth. We are creating a world where anyone, anywhere may express his or her beliefs, no matter how singular, without fear of being coerced into silence or conformity. Your legal concepts of property, expression, identity, movement, and context do not apply to us... We believe that from ethics, enlightened self-interest, and the commonweal, our governance will emerge.” (Barlow, 1996)

What might this experience of open protocols, and the hope they inspired during the early years of the internet, mean for the strategies of those engaged in platform cooperatives today? Let us take the example of ride-sharing, the current fiefdom of Uber. Ride-sharing could be considered a natural monopoly, which is to say it involves infrastructure you don't want to build twice - users don't want to have multiple identities, apps, user interfaces, price structures etc. The tech company that wooed the most venture capital now holds a near monopoly. Should Uber slip, the market would descend into open warfare, and neither situation best serves the people with cars and the people who need rides.

Into this situation, it is difficult for a platform cooperative to get started or to scale. So, what if instead of a platform cooperative, there was a protocol for ridesharing? This has been attempted once, without success by an Israeli project, Lazooz. But what if it had crowd-funded enough to run an advertising campaign and hire agents in cities not dominated by Uber? People could sign up to the network and announce their empty car seats or their hope to travel. They would find each other and remunerate each other in cash, Bitcoin, home-brewed cider or hugs; the line between giving a



friend a favour and earning a crust would be very grey. There would be no middle men collecting rent on the infrastructure and dictating how drivers should behave as representatives of the company. The protocol might support long distance travel, hitch-hikers, diversions to pick people up, maybe even cargo to reduce the number of empty trucks clogging and churning up the roadways. This open protocol for ride sharing could disrupt our transport ecosystem, vastly reducing the cost of travel and the number of vehicles on the road.

This protocol alone would not necessitate the existence of a cooperative. Where then does cooperative forms of organisation come in? The proper function of an institution is not to crunch algorithms or own infrastructure that could be common, but to manage trust and social relations. In this context drivers might aggregate into cooperatives to present a trusted brand appealing to those who wanted, say, flash cars, women only drivers, criminal record checks, insurance, etc.

Moving beyond ridesharing this protocol approach has many domains. Airbnb could be replaced in the same way. Real Estate agency could also change. Why should you have to commit to a single Estate Agent to sell your house and troop around many estate agents to find a house? There could just be a protocol for advertising and searching for residential property. Why is it still necessary in 2017 to advertise a second-hand bicycle on a centralised, censored, platform like craigslist, freecycle or the local supermarket or newspaper? Why isn't there simply common space for that? Open protocols would help pave the way.

The history of open protocols shows they enable efficiencies and economies of scale (e.g. the USB and x86) which reduces prices and waste. Open protocols also wrest control from individual firms with the relevant intellectual property and thus enable competition from new entrants. However, they do not prevent new monopolies from emerging over time. With the internet, capitalist interests, as manifested by venture capital and then investment banks, backed those enterprises that worked out how to build services, private territories and gateways on top of the internet's open protocols and to build the notion of private property and the means of production into the internet. Only then could companies like Facebook and Google/Alphabet start monetising value for investors, even while the lower layers remain free as designed. The importance of network effects to the value of any platform, whereby they are as useful to the extent they are ubiquitous, it is hard to imagine any platform like minds.com competing head-to-head with Facebook succeeding to become similarly large and influential.

One recent protocol that threatened to democratise everything was Bitcoin. As described earlier, Bitcoin is a protocol for different 'wallet' programmes on different computers to share a common ledger and thus agree how much is in each wallet. It enables a global payment system without the need for a central institution to keep the definitive ledger, and so it allows a money system without states or banks. Bitcoin has turned out to be flawed in that its mass adoption led to an unintended form of centralisation, where computing power is decisive. Better algorithms have long existed, although so far Bitcoin retains its first mover advantage. (Torpey, 2014)

To summarise, we see that platform cooperatives have limited potential unless new open protocols are introduced to enable multiple entrants into a single ecosystem. In absence of benevolent monopolies, utility will be sub optimal unless open protocols enable interoperability. Open software protocols mean that it is more difficult to maintain a monopoly position so, forcing entrepreneurs and investors to focus on competition rather than attempting to monopolise a whole market. . As many new entrants will fail, if there are open protocols, what they have created while failing can add to the ecosystem, rather than adding to the mountain of junk code or leaving users stranded.

Some non-neoliberal thinkers may argue at this point that the way for the digital infrastructures we have described to be available and affordable to all with minimum restrictions is for government to provide it. Although we have sympathy for this view, after decades of privatisation we consider that



in many countries this approach is unlikely. The experience of both Internet and Bitcoin protocols is that being open and free allows rapid adoption and experimentation, but may not protect against the domination of applications and services based on those protocols and therefore there is a clear case for more government regulation to enable competition than is currently the norm.

Applying Lessons: Restoring the Credit Commons

Uber has raised truly enormous quantities of capital, by promising to monopolise logistics and driverless cars, and many people are concerned about the vision of the economy that Uber projects. However, monopolies in the payment and credit areas pose a greater threat both to the economy and to individual freedom in general. Although the banking system is not one corporation it operates as a single club with a very high barrier to entry determined by the government. Members of the club record and honour their mutual debts using private protocols. Until recently this was not very examined, but blockchain technology has highlighted how payments could be implemented faster, safer, cheaper and cast the banking system as an outmoded private rent-seeking cartel.

There are critics of this system from within heterodox monetary economics. Some cite the work of the economist Hyman Minsky (1919–96) to propose that a free market of competing private currencies would be preferable than the current system (Wray, 2015). That view is cited by many entrepreneurs and investors in cryptographic currencies like Bitcoin. However, if a currency, credit, payment or directory system does not enable interoperability, then the benefits for users of everyone using the same system means the market will naturally select a few large services. As discussed earlier, in other areas that involve significant network effects, such as internet search, social networks and the access economy, for-profit firms have sought and often succeeded to dominate a sector, giving rise to growing concerns. Given that currencies and their associated credit and payment systems are such important utilities, avoiding monopolies to emerge in the private currency field will be an important challenge, and require conscious effort from socially-minded innovators and regulators.

The power of capitalists to out-compete and out-grow cooperatives in most countries is partly related to their interaction with the banking system. The banks can issue almost unlimited credit to large enterprises, thereby marshalling far more resources to their initiatives and agendas (Bendell and Greco, 2013). Therefore, social movements are usually peripheral to the economic trajectory of societies. Therefore, innovation in currency and credit that is aligned to commons philosophies needs to be central to a broader commons agenda.

The concept of the commons can be applied to our means of exchange – money and credit. Therefore, with the term “credit commons” we mean our ability, as free individuals and organisations, to issue and honour credit to whomever we choose, in a form and volume that we decide, without having to pay state-sanctioned private intermediaries (Bendell and Greco, 2013). “The key insight from a study of the history of money is that we have allowed the credit commons to be privatized so that it can be accessed only by appealing to some bank to grant a “loan”. Today’s monopoly on credit creation by private banks now drives a range of economic, social and environmental problems” (ibid).

As “thinking partners” focused on how to scale collaborative credit systems, we have concluded that open protocols to enable interoperability between complementary currencies is an important next step. In arriving at that view, we have found the concepts of the commons to be helpful and therefore have adopted the name Credit Commons Collective for the group now working towards those aims. In the final sections of this paper, we summarise known attempts at interoperability,



the barriers that currently exist, and design principles for a currency exchange system between complementary currencies.

We would like to highlight the three most useful interoperability projects we know of. First, the Universal Currency (UC) was created by the International Reciprocal Trade Association for its members. Not a clearing house between different currencies, the UC is a separate exchange with its own currency which members of all participating exchanges can also join. The exchange is governed by IRTA and since 2015, provided by Bartercard, the largest B2B exchange in the world. Second, a standard was created for exchanges to publish an RSS feed of offers and wants on their individual exchanges, and to read that feed from other exchanges. This can be used in conjunction with the UC, but technically it has not been sufficient to enable cross-platform searches and sales. Third, when the Australian LETS moved to a clone of CES in 2012, Tim Jenkin built a system called Clearing Central to allow trade to continue between the two servers. Since then Spain built its own CES platform, called Integral CES, which also connects to Clearing Central, and Community Forge exchange software is connected as well. There is not yet a way to view catalogues on other servers.

The commercial barter sector and social currency movement have long been at a point of maturity when standards might be expected to emerge (even the same protocol for both), yet the above initiatives are technologically crude and not widely used. The oft-heard lament from users that there is a lack of variety in the marketplace offered on individual exchanges could be quelled by greater interoperability.

Analysing this situation, we have identified some of the obstacles to greater interoperability. First, are technological challenges. We observe how much software today is directed at mobile phones apps, and both the commercial barter sector and social movements are still focused on the users of web browsers. Just as young software engineers are starting their own high risk projects rather than supporting functioning projects, the complementary currency platforms rely on older engineers who know nothing of the technologies of the current decade.

Second is the risk aversion and priorities of incumbents. In conversation with some business barter software providers we found they did not think that interoperability would increase their turnover. We suspect there is a fear also of their captive markets being freed. It is also easier for them to design and run projects internally to organisations, so resources tend to be allocated towards adding features and competing with other platforms.

Third are the shallow connections in the social movement and profession in complementary currencies. There has been no shortage of online conversations, conferences and proposals for various forms of cooperation, but so far, insufficient money and energy have been committed to enabling the movement and profession, by creating useful umbrella organisations or consulting software experts to draw up open protocols.

Finally, and no less significantly, are challenges in the realm of discourse and philosophy. On the one hand, the well documented investment and enthusiasm about blockchain innovation has barely touched existing economic networks, while the collaborative credit concepts been elbowed aside by the Austrian economics implicit in Bitcoin's design. On the other hand, many users and activists of local currencies conflate local circulation with local issuance. They feel that if a currency goes out of bounds, it begins to resemble the system of global capital they hoped to shelter from.

We believe that even the limited adoption of a better protocol (or set of protocols) could change the systemic drivers which now separate value-creators into separate marketplaces. It would make small exchanges much more viable, thus allowing for greater monetary experimentation. It would

allow greater convergence around software, thus reducing overall development costs, which should translate into reduced membership costs. And by linking together the major networks into a whole, that whole would become a focal point for collaborative credit initiatives the world over.

Towards a Principle of Currency Exchange in a Credit Commons

To function well, the Credit Commons will require a clear understanding of the principles by which complementary currencies will be cleared between systems. One key issue for that is the establishing of exchange rates and balance-of-trade limits. To design the appropriate system will involve building on existing theories of currency exchange and monetary history. To aid discussion, we now share our initial thoughts on this matter.

Mundell's trilemma is important for understanding exchange rate mechanisms (Burda and Wyplosz, 2005). It shows how, in designing relations between a domestic market and the rest of the world, a country (or market) must sacrifice either monetary policy, balance of trade, or capital flows. Internationally, the current system of national currencies allows Wall Street to issue dollars to pay for US imports, and to have those dollars lodged eternally in foreign central banks – never to be redeemed or exchanged for US exports. This 'free-floating' currency system gradually replaced the gold standard after the US defaulted in 1971, and assumes currency to be a commodity whose price is determined by supply and demand.

This approach to exchanges between currencies is problematic for complementary currencies, because it does not enable a balancing of trade. If a balance of trade is maintained, a currency can function as an IOU rather than masquerading as a pseudo-commodity. The "foreign" market also loses its power to disrupt a domestic market, so that domestic monetary policy, which all collaborative credit systems currently exercise, is not compromised.

The system of exchange needed for a clearing system in the Credit Commons is not like the Bretton Woods gold/dollar standard, having neither gold nor dollars, nor like the current system of floating exchange rates because there can be no authority above the local exchanges which can deprive them of sovereignty. Therefore, we propose some requirements. First, a clearing system should allow each participating currency to set its own price in relation to the other currencies. Second, it should be oriented around tracking and restoring the balance of trade of each exchange. Third, exchanges should negotiate the maximum permissible imbalances of trade in order to contain the damage in case of default.

Astute readers will have already recognised that the exchange mechanism we are describing here is a mutual credit system. In fact, we envisage something structurally similar to Keynes' rejected International Monetary Union design, (a.k.a. Bancor) which the USA blocked at the 1944 Bretton Woods conference. This design would have put all the countries into one exchange managed by an international body, with the objective of preventing net-producers from wielding power over net-consumers, and reducing dependency on scarce gold for international settlement (Amato and Fantacci, 2009). While the Credit Commons Collective is clearly not a 'league of nations', we believe the operating principles are the same. In the Credit Commons White Paper (Slater and Jenkin, 2016) some modifications to the model are outlined to make it appropriate for myriad small exchanges, rather than a few nations, and so technology could bring it to every mobile phone rather than just an international office, like the International Monetary Fund (IMF).

In short, any actor should be able to invite other actors into a group, to determine trust extents, and then to bill or credit them within those limits. In this model, a group is also an actor at the next level, which means that a nested structure of groups can be built up, allowing payments between actors who don't know each other, but who are members of groups that do have a relationship. The

system does not require that every group be connected to the whole. Ideally the whole system can run on one blockchain. A blockchain could allow multiple users to write to the system, while guaranteeing the accounts are 'straight', and could permit only members who are within specific groups to see the private or anonymised information there.

Roadmap to a Credit Commons

Following the publication and distribution of a printed Credit Commons White Paper (Slater and Jenkin, 2016), around 30 people signed up to an online dialogue to help move the idea forward. After the discussions, a 'smart contract' prototype for a clearing system was created¹ in Ethereum, which was valuable for thinking through some implementation details. However, this prototype started to look expensive in terms of its ether consumption, since its many calculations must be verified by the whole system. Another approach was needed.

Other needs were also identified. The CES platform has not been refactored since 2002. Only one of the major platforms properly supported smartphones. Exchanges also need to peer into other exchanges before registering transactions with them. All this led us to a new "roadmap", leading gradually towards the Credit Commons clearing service described in the previous section. Along the way it seems necessary to bring together the existing movements with needed free open source components, thereby cutting their costs, improving service and increasing interoperability in other ways.

Now we are envisioning a mobile application development kit for local exchanges to build their own user interfaces with minimal programming skills. It would allow a user to be authenticated as a member of a group, and then access web services as an anonymised group-member. This would allow discreet community services to be built and maintained by separate entities, holding no sensitive data which can be connected to individuals, and then apps could be assembled quickly with the components each community needed. The roadmap below describes several modular small-to-medium sized projects which could be undertaken by volunteers or financed by philanthropists (Box 1).

Box 1: Roadmap of tools for the Credit Commons

The projects required to develop the credit commons clearing system include:

1. *A REST API for community exchange. A platform developer should be able to serve the API in no more than 2-3 days work.*
2. *A default mobile app confirming with the API described in 1. Thus the same app would work with any platform.*
3. *A single sign-on system to authenticate users as members of groups to the new suite of REST services below*
4. *A global index of offers and wants, a REST API for building search interfaces, and a default implementation. Each platform need publish only a sitemap.xml and register with the crawler. The default implementation would be easy to integrate into a web site or mobile phone app.*
5. *A REST API, and transaction storage service or online ledger perhaps using a blockchain. Also a default implementation for incorporating into apps.*
6. *Savings Pools API, a web service to manage claims and cashflow within a savings pool, according to the model developed in New Zealand, with a default implementation.*
7. *A credit commons similar to the above but to log transactions between exchanges, and with nesting as described. This is more likely to use a blockchain.*

1 Thanks to Rogelio Segovia

8. *A kit for building local community oriented applications. It would allow the above services and more to be assembled into a single user interface.*

Building software is the most technical work but not the only work of the Credit Commons Collective. We have seen first-hand and from a distance in how enthused non-technical volunteer users can contribute enormously to a software project. In Community Forge, an autonomous team has both fortnightly meetings and frequent informal contact to offer member communities a robust helpdesk service. They have fielded enquiries, developed training materials and a helpdesk site, customised sites, tested and tested and tested new versions, and attended and organised events. The beneficiaries of their free sites are highly satisfied. In Timebanks USA, the programmers for Community Weaver 3 (CWIII) have focused on software development, and a volunteer team of end-users meets online once a month to discuss how to spend a small budget, on new features, bug fixes, and then test the software before release. The result is a very user-friendly package, highly attuned to the needs of its users. Users in far off New Zealand reported (in a private meeting) being much happier with CWIII than with CWII which had no volunteers involved.

The Credit Commons Collective aspires to animate that kind of community, thereby building the next generation of community digital infrastructure. It will also benefit from being able to employ professionals at near market rates: not only technical professionals, but also communicators of which there are none in the above examples. By communication we mean skills in user experience, graphic design, marketing, advertising, social media, public relation strategies and conceivably even lobbying.

Our decision to share this work with wider academic audiences through this paper and others, is part of this new approach to engage a beyond the niche of complementary currency enthusiasts. Our hope is that researchers and educators will learn of the Credit Commons Collective and help us develop it further. There will be many knowledge needs, and thus much research to be done. However, we call on research to derive from practice, rather than see the efforts we describe in this paper as mere data for testing existing theories for self-interested motivations of writing publications that no one reads but help academic career progression.

Conclusions

"Mark Twain observed that the lack of money is the root of all evil; the transformational effects of digital money will be relatively most influential in poorer nations... While digital money will not remove poverty and inequality, it will provide a vital new tool in helping them to be addressed." (Dodgson et al, 2015, p 331).

The editors of the *Academy of Management Journal* are hopeful of the power of technology to uplift humanity. We are too. But our view is that the implication of digital technology for humanity will depend in part on how well the digital commons is developed, deployed and protected. In particular, an infrastructure of open source protocols and software related to collaborative credit systems will be crucial to avoid a digital dystopia of dependence on global multinationals that actively pursue monopolistic positions. We have outlined the philosophy behind and the strategy for the new Credit Commons Collective that is seeking to stimulate and coordinate efforts that can thwart an "Uber future" for currency, whereby we would be entirely dependent on a global company to make a payment for our daily bread, not just a ride to the store.

We recognise that the "thinking partner" method for reflective practice is not one that can be used to replicate results, and may therefore not receive respect for its scientific quality from people operating within a positivist paradigm. However, in this paper we have shown how the method has

helped us to structure our inquiry, to then clarify and share our subjective knowledge, in ways that may support progressive social outcomes. We recommend the method for socially-engaged reflective practitioners engaged in matters that they consider life-long quests.

References

- Alam, M.T., H. Li & A. Patidar (2015) "Smart Trading in Smart Grid Using Bitcoin," *Computer and Information Science*, Vol. 8, No. 2.
- Alpowitz, G (2013) *What then must we do?* Chelsea Green Publishing, USA
- Amato, M. & Fantacci, L. (2009) *The End of Finance*, Polity Press, UK.
- Angel, J.J. and D McCabe (2014) "The Ethics of Payments: Paper, Plastic, or Bitcoin?" *Journal of Business Ethics*, Volume 132, Issue 3, pp 603–611
- Barlow, J. P. (1996) "A Cyberspace Independence Declaration", <http://internet-guide.co.uk/ADeclaration.html>
- Barrea, T. J. (2015) "Bitcoin: A Pedagogical Guide for the College Classroom," *Journal of Education for Business*, Volume 90, Issue 6.
- Bendell, J and M. Slater (2012) "Helping Sustainable Currencies to Scale: Strategic Insights from Current Practice", Paper presented at the Tesla Conference, Split, Croatia, July 10th, 2012. www.teslaconference.com
- Bendell, J. and T. Greco (2013) "Currencies of Transition", in McIntosh, M. ed (2013) *The Necessary Transition*, Greenleaf Publishing: Sheffield, UK.
- Bendell, J., W. Ruddick and M. Slater (2015) *Re-imagining Money to Broaden the Future of Development Finance: What Kenyan Community Currencies Reveal is Possible for Financing Development*, Working Paper 2015-10, United Nations Research Institute for Social Development (UNRISD), Geneva. Download here.
- Bjerg, O. (2016) "How is Bitcoin money?" *Theory, Culture & Society*, Vol 33, Issue 1.
- Bollen, R. (2013) "The Legal Status of Online Currencies: Are Bitcoins the Future?" *Journal of Banking and Finance Law and Practice*, Online http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2285247
- Bollier, D (2008) *Viral Spiral. How the Commoners Built a Digital Republic of Their Own*, New York, London, New Press
- Bolton, G. (2010) *Reflective practice: writing and professional development* (3rd ed.). Los Angeles: Sage Publications.
- Burda, M. C. and C. Wyplosz (2005) *Macroeconomics: A European Text*, 4th edition. Oxford University Press.
- Cochran-Smith, M. and Lytle, S. L. (1999) "Relationships of knowledge and practice: teacher learning in communities," *Review of Research in Education*, Vol 24 (1): 249–305.
- Collier, J. and T Fuller (2005) "Corporations, ethics and global futures", *Futures*, Volume 37, Issues 2–3, March–April 2005, pp. 111-116

- Dalal, N. (2014) "Exploring the Bitcoin System: a Complex EconoSociotechnical Systems (CEST) Perspective", *International Journal of Conceptions on Management and Social Sciences*, Vol. 2, Issue. 3, Sep, pp 47-51.
- Dierksmeier, C. & Seele, P. J. (2016) "Cryptocurrencies and Business Ethics", *Journal of Business Ethics*, online and forthcoming in print. doi:10.1007/s10551-016-3298-0
- Dodd N (2014) *The Social Life of Money*, Princeton: Princeton University Press
- Dodgson, M., Gann, D., Wladawsky-Berger, I., Sultan, N., & George, G. (2015) "Managing digital money", *Academy of Management Journal*, Vol 58(2), pp 325–333.
- Egorova, N. E. and K. A. Torzhevskiy (2016) "Bitcoin: Main Trends and Perspectives", *British Journal of Economics, Management & Trade*, Vol 12(1): pp. 1-11.
- Ertz, M, Durif, F. and A. Manon (2016) "Collaborative consumption or the rise of the two-sided consumer," *International Journal of Business and Management*, Vol 6 Issue 6.
- Graeber D (2011) *Debt: The First 5,000 Years*, New York: Melville House
- Grant, G. and R. Hogan (2015) "Bitcoin: Risks and Controls", *Journal of Corporate Accounting & Finance*, Volume 26, Number 5, 1 July 2015, pp. 29-35(7)
- Harvey, D. (2014) *Seventeen Contradictions and the End of Capitalism*, Oxford University Press, USA.
- Kien-Meng Ly, M. (2014) "Coining Bitcoin's 'legal bits': Examining the regulatory framework for Bitcoin and virtual currencies", *Harvard Journal of Law & Technology*, Volume 27, Number 2 Spring 2014, pp. 587-608.
- Kostakis, V. and Bauwens, M. (2014) *Network Society and Future Scenarios for a Collaborative Economy*, Palgrave Macmillan, UK.
- Lewis, M. and Conaty, P. (2012) *The Resilience Imperative: Cooperative Transitions to a Steady-state Economy*, New Society Publishers.
- Loughran, J. J. (2002). "Effective reflective practice: in search of meaning in learning about teaching," *Journal of Teacher Education*, Vol 53 (1) pp 33–43
- Malovic (2014) "Demystifying Bitcoin: Sleight of Hand or Major Global Currency Alternative?" *Economic Analysis*, Vol. 47, issue 1-2, pp. 32-41
- Marx, K. (1867) *Das Kapital: Kritik der politischen Oekonomie*. (1st ed.). Hamburg: Verlag von Otto Meissner.
- Morais, A., Neves, I., Davies, B. & Daniels, H. (2001) (eds) *Towards a Sociology of Pedagogy: The contribution of Basil Bernstein to research*, New York, Peter Lang.
- Ostrom, Elinor; Burger, Joanna; Field, Christopher B.; Norgaard, Richard B.; Policansky, David (1999) "Revisiting the Commons: Local Lessons, Global Challenges," *Science*, Issue 284: 278–282.
- Popescu, G. (2014) "The Economics of the Bitcoin System", *Psychosociological Issues in Human Resource Management*, Vol 2(1) pp 57–62.
- Redman, J. (2017) "QE and Capital Controls Create Worldwide Demand for Bitcoin", January 22nd, Bitcoin.com

- Richter, C., S. Kraus, and R.B. Bouncken (2015) "Virtual Currencies Like Bitcoin As A Paradigm Shift In The Field Of Transactions", *International Business & Economics Research Journal* – July/August 2015, pp. 575-586.
- Rogojanu A. and Badea L. (2014) "The issue of competing currencies. Case study – Bitcoin," *Theoretical and Applied Economics*, Vol. XXI. No. 1(590), pp. 103-114
- Sauer, B. (2015) "Central Bank Behaviour Concerning the Level of Bitcoin Regulation as a Policy Variable", *Athens Journal of Business and Economics*, pp 273-286.
- Scott, B. (2016) *How Can Cryptocurrency and Blockchain Technology Play a Role in Building Social and Solidarity Finance?* UNRISD Working Papers, UNRISD, Geneva.
- Slater, M. (2011) "Complementary Currency Open Source Software in 2010," *International Journal of Community Currency Research*, Vol 15 (D) pp 82-87.
- Slater, M. and T. Jenkin (2016) The Credit Commons White Paper, www.creditcommons.net
- Smith, A. and M. F. Weismann (2014) Are You Ready for Digital Currency? *Journal of Corporate Accounting & Finance*, Vol 26, Issue 1, November/December, pp. 17–21
- Thiel, P. (2014) "Competition is for Losers: If you want to create and capture lasting value, look to build a monopoly," *Wall Street Journal*, September 12th. <https://www.wsj.com/articles/peter-thiel-competition-is-for-losers-1410535536>
- Torpey, K. (2014) "Bitcoin Will Never Be Replaced by an Altcoin," cryptocoinsnews.com, June 6.
- Wadsworth, Y. (2010) *Building In Research and Evaluation: Human Inquiry for Living Systems*, Routledge, UK.
- Weber, B. (2014) "Bitcoin and the legitimacy crisis of money", *Cambridge Journal of Economics*, Vol 40 Issue 1, pp 17-41.
- Wray, L. R (2015) *Why Minsky Matters: An Introduction to the Work of a Maverick Economist*, Princeton University Press, USA.
- Yahanpath, N., & Wilton, Z. (2014) *Virtual money: Betting on Bitcoin*. University of Auckland Business Review, 17(1), 36–43.