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MONEYLAB

READER

**AN
INTERVENTION
IN DIGITAL
ECONOMY**

FOREWORD BY **SASKIA SASSEN**

EDITED BY
**GEERT LOVINK
NATHANIEL TKACZ
PATRICIA DE VRIES**
INC READER #10

MONEYLAB

READER

**AN
INTERVENTION
IN DIGITAL
ECONOMY**

MoneyLab Reader: An Intervention in Digital Economy

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NATHANIEL TKACZ
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INC READER #10

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INTERNATIONAL CONFERENCE

MONEYLAB

COINING ALTERNATIVES

Institute of Network Cultures
networkcultures.org/moneylab

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NETWORK CULTURES

CREATING
ALTERNATIVE
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21-22
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SPROUTING NEW
DIGITAL-ECONOMIC
FORMS IN TIMES
OF CRISIS

MONEYLAB IS AN INITIATIVE OF THE INSTITUTE OF NETWORK CULTURES,
HOGESCHOOL VAN AMSTERDAM.

**WHEN MONEY
BECOMES AN
EXTRACTION
TOOL RATHER
THAN EXCHANGE
MEDIUM:
FOREWORD TO
THE MONEYLAB
READER**

SASKIA SASSEN

WHEN MONEY BECOMES AN EXTRACTION TOOL RATHER THAN EXCHANGE MEDIUM: FOREWORD TO THE MONEYLAB READER

SASKIA SASSEN

MoneyLab is an exciting and strategic project. The diversity of contributions to this volume is exceptional and promising. It is impossible to do justice to this enormous variety of ideas and proposals in a short preface. I will focus on what we might think of as one step, one building block in the larger debate engaged by MoneyLab: the need to develop new types of currencies to enable new types of economies.

We need exchange mediums, such as money. But today's versions of money are mostly the official currencies of countries. And these are becoming extremely problematic. Why? Because they function less and less as an exchange medium and more and more as a tool for governments and corporations to extract household resources for their aims, often overriding the basic needs of a country's people.

The official currencies of countries today have become a bridge into household resources – a mechanism for extracting value from even poor households. Taxation without citizen participation in how to spend those taxes is another mechanism. The corporatizing of economies is yet another. When corporations capture most of what consumers spend then they also disproportionately control how that household money is invested and allocated (for instance, extreme increases in corporate salaries rather than investing in developing organic food).

Under these conditions, money is no longer simply an exchange medium. Nor is it a medium for ensuring large-scale investments – by either governments or corporations – into what a locality, a country, needs for its people. It becomes an instrument for implementing what governments and corporations want.

Yet not all alternative moneys are necessarily desirable. The key is a decentralized currency to enable the proliferation of non-corporate economies, and to do so at scales and with modalities that go beyond simple barter. Barter is fine for many operations, and it has thrived in certain settings, notably in parts of Latin America. But it is not enough. We need to scale-up if we are going to take back economic terrain now fully captured by large corporations. And we need to do this, even if some of the larger needs of a locality, notably transport systems, will have to be built by large corporations.

Digital currencies are clearly one option. Most recently Bitcoin has drawn a lot of the attention. It has also become a destination for speculative investment. This has in turn raised some key questions, notably whether it is a decentralized currency. The

challenge is to avoid the corporatizing of a currency, which is now the situation with more and more official currencies.

Again, by corporatizing I mean that it serves to transform household resources (as measured by consumption capacity) into corporate profits, which can then be invested without any concern or need to know a locality's demands. Mostly, a modest firm that depends on a locality's choices is going to have to be responsive in a way that the large corporation is not. Further, the power of large corporations to set up franchises which might have to be a bit more responsive to a locality's needs, mostly winds up eliminating the locally owned businesses so the franchise can rule uncontested – a take it or leave it stance vis-à-vis the locality. Finally, and inevitably, the franchise has to pass on some of the locality's consumption capacity to central headquarters. Ideally, a decentralized currency would favor local initiatives and redistribution in localities.

In the last twenty years this shift towards the corporatizing of household money has accelerated and become increasingly acute in more and more of the world. Up to a certain point we need governments and corporations for some of our needs: vast transport systems, public buildings, airports, harbors, and so on. But much of this far too easily winds up using our money for their profit rather than our needs. One result is growing asymmetries of all sorts, marked by growing concentrations of wealth and expanded impoverishment at the other end. There are exceptions here and there, but they are not enough to obliterate these asymmetries.

Further, to some extent our governments have enabled the power of corporations to extract household money not just via consumption but also via their policies. The elegantly named 'quantitative-easing' is one such example. In this post-2008 crisis period, the U.S. has been the most active government in transferring households' money to corporations, especially big banks and major financial firms. Only a small portion of this (U.S. \$ 320 billion) has been via proper channels – the legislature, where there is a chance of a public debate where we the citizens can, in principle, voice our take on it all. But by far most has been done secretly, and we only found out via freedom of information requests how our money was spent: over \$7 trillion dollars were secretly transferred from U.S. households to the global banking system. Several trillion more were transferred via quantitative easing, a public event, but incomprehensible to the average household; this is language that does not spell out that it is households' money that is being transferred. Quantitative easing is also what the European Central Bank wants to implement in the European Union.

Yes, we need decentralized currencies that function as genuine exchange mediums to handle a vast range of the needs of households, modest firms and localities. It would mean avoiding franchises and establishing locally owned operations – the profits then recirculate in the community or city rather than partly being captured by corporate headquarters. At the same time, we need national currencies to engage in the vast infrastructural and servicing projects that a country requires to address the needs of its people; and this may mean contracting with large engineering corporations. But this should not be necessary for most of the food, furniture and such.

Decentralized currencies should enable bringing significant components of our modern economies back into our communities. And if these currencies are digitized, local

initiatives and innovations can get replicated across a region, country's or a continent's localities. This is one way of constructing larger multi-nodal operational spaces that can cut across diverse types of boundaries without losing their local insertion.

What we do not need is what is happening today in a growing number of countries: the large scale direct and indirect appropriation of the income of households and of modest firms to finance the profit-seeking aims of corporations.

Saskia Sassen, Columbia University. Many of the points raised in this preface are fully developed in her new book *Expulsions: Brutality and Complexity in the Global Economy*, Harvard University Press, 2014.

MONEYLAB: SPROUTING NEW DIGITAL- ECONOMIC FORMS

**GEERT LOVINK
AND NATHANIEL TKACZ**

MONEYLAB: SPROUTING NEW DIGITAL-ECONOMIC FORMS

GEERT LOVINK
AND NATHANIEL TKACZ

The best way to rob a bank is to design a currency.
– Johan Sjerpstra

Welcome to MoneyLab, a network of artists, activists and researchers, founded in 2013 by the Amsterdam-based Institute of Network Cultures; its aim is to research, discuss, and experiment with (alternative) internet-related revenue models in the arts and beyond. The initial MoneyLab: Coining Alternatives conference was organised in March 2014 in Amsterdam and focussed on the Bitcoin debate, first steps in crowd-funding research, mobile money in Africa and beyond, and artistic responses to the 2008 global financial crisis, on-going recession, fo reclosures and insolvencies. This reader can in part be read as the proceedings of this event (the program of the conference is included in the back of this publication). In our text 'Friends with Money', included in the *Disrupting Business: Art and Activism in Times of Financial Crisis* anthology, we have laid out the programmatic intentions of our interventionist research. We're not going to repeat that here. Instead, we want to go through a few key developments and identify touchstone authors in the MoneyLab *umfeld*. We conclude with the outlook of MoneyLab two years into the project and reassess the relation between experimentation-innovation and radical critique, inside and outside academia.

MoneyLab begins when network cultures and their corporate counterparts come to see the network as generative of new economic forms. Money is no longer a given, coming from outside. Currency, tokens, 'wallets' and technologies of payment are all fair game, all up for grabs. The spectacle of Bitcoin has drawn everyone's attention, but the heavyweights – Google, Facebook, Amazon, Apple, Samsung, etc. – have also been busy reimagining themselves as financial services and payment providers for the platformed masses.

Meanwhile, the networked subjects are left to their devices, having to generate revenue themselves and create something out of nothing, from zero to one. Neoliberal subjects find themselves in permanent start-up mode. In times of advanced stagnation we can neither count on subsidies, nor investments provided by the traditional world

1. Geert Lovink and Nathaniel Tkacz, *Data Browser*, New York: Autonomedia, 2013, pp. 175-191. See also: <http://networkcultures.org/moneylab/about/background/>.

of finance. Welcome to digital realism. The 99% have all become survival artists in our austerity networks, subjected to rolling crises amidst never-ending economic decline. The search for new modes of value extraction intensifies. The latest ubiquitous technology is financialization itself. In this not-so-brave new world, conflict risks being superseded by competing economic visions articulated through software. Destroy the system! Bitcoin or Ripple?

The content potlatch is over. You can share – but who cares? The copy is neither the problem nor the solution and tends to postpone rather than speed-up the decisions ahead. The classic distinction between the idealistic hacker and the opportunistic start-up entrepreneur has started to blur. It is no longer clear whether genuine alternatives are unfolding, or we are simply witnessing creative destruction without a cause. Disruption has become an aim in itself. What will we pitch? Dunno? How about potato salad?²

We used to take for granted that money circulates, but now we are forced to invent it, time and again. The Lab is our creative jail. No solution coming from here will ever become sustainable: we are locked-up in a mad house of temporary standards for ‘additional’ sources of income. Additional to what? many of us will ask ourselves. Will the tiny revenue streams ever swell, or will they remain as erratic as the global weather? Can micropayments ever create a New Renaissance or should we be more realistic? Shouldn’t we combine the desire for new revenue models with a demand to redistribute income?

Let’s scan the future spectrum of technologies of (re)distribution. You have been signed up for the *network economicus*: the internet reconfigured as a suite of financial services, as a space for conducting and intensifying financial selves – entrepreneurs, funders, venturers, exchangers, and of course, debtors. *Network economicus* presents an archipelago of platform economies. Google, Apple, Facebook, Twitter—all working to harness the lock-in effects of social ties in order to generate and extract value from routine economic activities beyond the service/data-profile/advertising complex.

Could it be that the real killer app of the net has been uniformly overlooked? We are talking, of course, of internet banking. Imagine how different the frontier mentality of earlier phases of ‘new media’ would look if it paid serious attention to net banking. There is no community, no collaboration, no anonymous exploration of multiple selves. It never took place in a virtual world and is in no way progressive. Instead we see user accounts linked to real identities supported by hard documentation. These are websites that function to support utterly mundane financial tasks. Security, of selves and of the general infrastructure, is a central concern. The goal of the net banking experience is seamless functionality and ease of transfer, devoid of any unforeseen potentiality, where financial subjectivity is quietly fostered through the routine browsing, clicking and scrolling through of one’s meaningful numbers.

Large portions of the web have now been recast in this imagining of internet banking. But the converse is also true. Contemporary banking is folding in the logics of personalisation, recommendation and advertising, and is starting to borrow from design

2. Kate Harrison, ‘Crowdfunding Potato Salad: Funny or Insulting?’, *Forbes*, 8 August 2014, <http://www.forbes.com/sites/kateharrison/2014/08/08/crowdfunding-potato-salad-funny-or-insulting/>

techniques pioneered in social media and other commercial platforms. In England, for example, online statements are now riddled with promotional material, which are derived from their clients spending and purchase histories. User accounts now come with money management dashboards that categorise and visualise spending and saving habits, or lack thereof. And, of course, the banks are in on the data profiling game.

In the U.S., the East-West division of powers is shifting. The visions and aspirations of Wall Street and Silicon Valley are merging. Start-ups are now looking to innovate at the level of money, payment and funding, while financial companies innovate through technology. Finance is increasingly where the geeks end up: mathematical modelers, machine learning experts, physics majors and so on. Increasingly, their target is the 'data flows' of social media and related platforms. Front-end financialization of the web coincides with the discovery that the web can be used as a financial resource. Wikipedia page edits can be used to predict stock movements. Social media platforms are machine-readable and the content of these 'flows' is reflected in fluctuating stock values. The hacking of the Associated Press Twitter account in April 2013 showed all too well the new volatilities of finance when it becomes subject to the status update. MoneyLab takes place within this layering of financial techniques and technologies. Some of these developments are beyond reach, but we must not fear finance as such. This point has been made most clearly by financial activist Brett Scott, who contributed to the MoneyLab conference. Scott's technique is to approach the world of finance through the mindset of the hacker. We might equally ask what other strategies of engagement are possible?

Historically, the MoneyLab project can be situated as one of the many post-global financial crisis initiatives that emerged after the global uprisings of 2011, in particular Occupy. In a sense, Occupy was not enough about Wall Street and was too inward looking at the internal dynamics of becoming a movement in the 21st century. Occupy showed not only how mainstream the discontent of global finance was, but also demonstrated the need for alternative views on money, capital, income and finance. MoneyLab emerged a few years into the Bitcoin craze and similar cryptocurrency experiments. Early days wherever you looked. That's the spirit of MoneyLab. The critique of global finance is there but is still waiting for its own 'Piketty' moment. There is a growing awareness of 'dark pools' and other absurdities (thanks to Scott Peterson³ and the pop literature of Michael Lewis⁴), but how can all this evidence be turned into an organised outrage or even be translated into policy? Many of us fear that regulation alone will not do the job. It is not enough to decommission this or that financial tool. Besides a General Theory of Global Finance for the 21st Century, we also need blueprints for how money should be generated in this age of digital networks.

MoneyLab talks strategy. In his book *The Quants*, Scott Patterson discusses proposals to ban quants from Wall Street. To him 'that would be tantamount to banishing civil engineers from the bridge-making profession after a bridge collapse. Instead, many

3. Scott Patterson, *Dark Pools, The Rise of A.I. Trading Machines and the Looming Threat to Wall Street*, New York: Random House, 2012.

4. Michael Lewis, *Flash Boys: A Wall Street Revolt*, New York: W.W. Norton & Co., 2014.

believed the goal should be to design better bridges – or, in the case of the quants, more robust models that could withstand financial tsunamis, not create them.¹⁵ But what's better 'design' in the age of algo wars? Is Bitcoin the better bridge? What does it mean to improve systems when we have reached the end of the liberal market illusion? There will always be 'new insiders'. Will it be Apple, Google and Facebook this time? Or should we expect the telcos to become the new banks?

In her 2014 book *Expulsions*, Saskia Sassen points to the Theatre of Cruelty, the neo-liberal revenge on the poor, as a result of the 2008 financial crisis. In terms of strategy, this is always good to keep in mind: there are hidden costs, there is a long-term fall out. The autonomy of the 'money that went to heaven' is relative. As we know from our own youth: not even a game of Monopoly is innocent and without consequences.

Philip Mirowski's *Never Let a Serious Crisis Go to Waste* from 2013 asks the simple but hard question: how did the neoliberals emerge from the crisis stronger than ever? The MoneyLab project should at least open up this line of critique. What if all these well-meant, constructive alternatives only strengthen neoliberal policies and benefit the parasitic 1%? Or worse, what if the very alternatives proposed are themselves somehow neoliberal? Should we go on an alternatives strike and even refuse to formulate any form of criticism? What's the deadliest form of negativity in the world of finance? The questions Mirowski asks eventually culminate in the organisation issue of the adversaries. On the positive side, initiatives such as MoneyLab can also come together in an organized network and eventually flip into a Thought Collective (as Mirowski calls it), a global initiative that can review and distribute alternatives seeds. He asks, 'What would a vital counter narrative to the epistemological commitments of the neoliberals look like?'¹⁶ Can we be so bold and answer: MoneyLab? Or would that be premature? If the 'major ambition of the Neoliberal Thought Collective is to sow doubt and ignorance amongst the populace,' what role can internet-based research networks such as MoneyLab play? Is it enough to emphasize the mix of radical critique and concept development? If, as Mirowski states, 'true political power resides in the ability to make the decision to "suspend" the market in order to save the market,' is it enough for opposite forces to uncool entrepreneurial myths and break the spell of the unchallenged capitalist consensus? Is our Decision a purely semiotic one?

So far the left has mainly defended mid-20th century models of the welfare state and demanded the redistribution of money, instead of considering the radical reinvention of money itself. Alternative, complimentary and local currencies have remained at the margins. It is one thing to conclude that the think-tank model itself is an outmoded organisational form to do research and make policy. The professionalism of the NGO model is too dull, too slow for this fast-moving world of continuous events, wars, climate disasters and political ruptures. In this light Mirowski asks the 1000 Bitcoin question: 'Is there a coherent alternative framework within which to understand the interaction of the financialization of the economy with larger ebbs and flows of political economy in the global transformations of capitalism?' One possible direction that

5. Scott Patterson, *The Quants: How a New Breed of Math Whizzes Conquered Wall Street and Nearly Destroyed It*, New York: Random House, 2011, p. 318.

6. Philip Mirowski, *Never Let a Serious Crisis Go to Waste*, New York: Verso Books, 2013, p. 356.

needs to be discussed is the issue of the financialization from below. So far, financialization has only been understood as a move from trade and commodity production to profits from financial channels.⁷ Is the monetisation of services that were once free of cost (or that did not exist in the first place) changing this picture?

Are initiatives such as MoneyLab ready for the 'exception' and the financial state of emergency as predicted by websites such as Zero Hedge and RT celebrities such as Max Keiser?⁸ Do we, unconsciously, underestimate the urgency of the current situation? According to Mirowski this is precisely what defines the behaviour of financial elites: they know how to get ready for the next crash. 'Neoliberals may preach the rule of law, and sneer in public about the ineptitude of government, but they win by taking advantage of "the exception" to introduce components of their program unencumbered by judicial or democratic accountability. They know what it means to never let a serious crisis go to waste.' Are we ready? Are efforts to collectively imagine alternative, internet-based revenue models, for instance for the arts, ready to operate after the Great Collapse?

The MoneyLab Reader brings developments in crowdfunding, digital and crypto currency, mobile money services, technologies of payment and other economic experiments into dialogue. It is naïve to see them as unrelated or to dismiss them offhand. Now more than ever we need constructive engagement with the hackers, entrepreneurs and other creators of economic alternatives. Audaciousness in times of austerity. First, though, we need a map of the present: What works and what doesn't? What is worth pursuing and what must be left aside? What tips the dominant ideology? Which histories are bearing on the present? And what are the limits of our own economic imagination?

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8. See <http://www.zerohedge.com/> and <http://rt.com/shows/keiser-report/>.

MONEY IN THE MAKING OF WORLD SOCIETY

KEITH HART

MONEY IN THE MAKING OF WORLD SOCIETY

KEITH HART

According to writers as varied as John Locke and Karl Marx, ours is an age of money, a transitional phase in the history of humanity. Seen in this light, capitalism's historical mission is to bring cheap commodities to the masses and to break down the insularity of traditional communities before it is replaced by a more just society. It matters where we are in this process, but opinions on that differ widely. When a third of humanity still works in the fields with their hands, I would say that capitalism still has a way to go. The Victorians believed that they stood at the pinnacle of social evolution. I think of us as being more like the first digging-stick operators, primitives stumbling into a revolution as significant as the invention of agriculture. They had no idea that it would culminate in Chinese civilization and neither can we anticipate what we could be launching now. We just know that our moment in history is an extremely dangerous one.

Money has called the present phase of world society into being and I would like to explore its potential to repair the damage that it has caused. In the second half of the 20th century, humanity formed a single interactive social network for the first time. Emergent world society is the new human universal – not an idea, but the fact that 7 billion of us desperately need to find new principles of association. The task of building a global civil society for the 21st century is urgent. But we must lose a lot more before the need to rebuild world society is likely to be taken seriously. Certainly we have regressed a long way from the hopes for freedom and equality released by World War II and the anticolonial revolution that followed it. On the other hand, growing awareness of the risks for the future of life on this planet might encourage people to take humanity's current predicament more seriously. The ecological ('green') paradigm – manifested as concern for global warming and for scarce food, water and energy supplies – could replace market fundamentalism as the religion of this emergent world society. But that will not do us much good if it entails rejecting money and markets for the illusion of local self-sufficiency.

The Origins of Our Times

The 1860s saw a transport and communications revolution (steamships, continental railroads, and the telegraph) that decisively opened up the world economy. At the same time a series of political revolutions gave the leading powers of the coming century the institutional means of organizing industrial capitalism. These were the American Civil War, the culmination of Italy's *Risorgimento*, the abolition of serfdom in Russia, the formation of the Anglo-Indian super-state, Britain's democratic reforms at home, and Japan's Meiji Restoration. German unification at the end of the decade spilled over into the 1870s through the Franco-Prussian war, the Paris Commune, and the formation of the French Third Republic. The First International was formed in 1864 and Karl Marx

published the first volume of *Capital* in 1867. The concentration of so many epochal events in such a short period would suggest that world society was quite well integrated even then. But in the 1870s, international trade accounted for no more than one percent of Gross National Product in most countries and the most reliable indicator of Britain's annual economic performance was the weather at harvest-time.¹

Capitalism has always rested on an unequal contract between owners of large amounts of money and those who make and buy their products. This contract depends on an effective threat of punishment if workers withhold their labor or buyers fail to pay up. The owners cannot make that threat alone: they need the support of governments, laws, prisons, police, even armies. By the mid-19th century, it became clear that the machine revolution was pulling unprecedented numbers of people into the cities, where they added a wholly new dimension to the traditional problem of crowd control. The political revolutions of the 1860s and 70s were based on a new and explicit alliance between capitalists and the military landlord class (who had been sworn enemies in the bourgeois revolutions) to form states capable of managing industrial workforces and of taming the criminal gangs that had taken over large swathes of the main cities. Germany and Japan provide the clearest examples of such an alliance, which took a specific form in each country.

Before long, governments provided new legal conditions for the operations of large business corporations, ushering in mass production through a bureaucratic revolution. The author of this new synthesis (which I call 'national capitalism') was G.W.F. Hegel who argued in *The Philosophy of Right* that states, run by university-trained bureaucrats, should regulate capitalist markets with a view to containing their extreme consequences, while encouraging their material benefits to accrue to citizens across the board. The national system became general after World War I and was the dominant social form of 20th century civilization. Its apogee or 'golden age' was in the period 1945-1979.² This was a time of developmental states, economic growth, and redistribution when, for the first and only time in history, the purchasing power of working people and the public services available to them were the principal goals of economic policy everywhere – in the Soviet bloc and postcolonial states, as well as in the Western industrial societies. 'Development' replaced colonial empire as the norm of relations between rich and poor countries. When, shortly before his downfall, Richard Nixon announced that 'we are all Keynesians now', he was reflecting a universal belief that governments had a responsibility to manage national capitalism in the interests of all citizens.

The 1970s were a watershed. U.S. expenditures on its losing war in Vietnam generated huge imbalances in the world's money flows, leading to a breakdown of the fixed parity exchange-rate system devised at Bretton Woods in 1944. The dollar's departure from the gold standard in 1971 triggered a free-for-all in world currency markets, leading immediately to the invention of money market futures. The world economy was plunged into depression in 1973 by the formation of the Organization of Petroleum-Exporting

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1. W. Arthur Lewis, *The Evolution of the International Economic Order*, Princeton: Princeton University Press, 1978.
 2. Eric Hobsbawm, *The Age of Extremes: The Short Twentieth Century 1914-1991*, London: Little Brown, 1994.

Countries and a hefty rise in the price of oil. ‘Stagflation’ (high unemployment and eroded purchasing power) increased, opening the way for Reagan, Thatcher, and other neoliberal conservatives to launch a counter-revolution against social democracy in the name of giving priority to ‘the market’ rather than ‘the state’. These events three decades ago and the policies pursued then find their denouement in the world’s economic crisis today.

In the mid-1970s, all but a minute proportion of the money exchanged internationally paid for goods and services purchased abroad. Forty years later, these payments account for only a small fraction of global money transfers, the vast bulk being devoted to exchanging money for money in some other form (foreign exchange transactions alone reached daily turnover rates of U.S. \$5.3 trillion in 2013). This rising tide of money, sometimes known as ‘the markets’, represents the apotheosis of financial capitalism, with political management of currencies and trade having been virtually abandoned in favor of freeing up the global circuit of capital. As a result, we have lived through an explosion of money, markets, and telecommunications for more than three decades and are now experiencing the consequences.

This process of ‘globalization’ represents a rapid extension of society to a more inclusive level than the 20th century norm, when society was identified with the nation-state. For us to live in the world together, we have to devise new ways of doing things for each other that go beyond the ideal of achieving local self-sufficiency that drove national economy in the modern era and domestic economy before that.³ Globalization is closely linked to the extension of society by means of money and markets. I follow a number of writers – Marx, Simmel, Mauss, Polanyi, Keynes – who believed in money’s centrality to a variety of options for a better society.

A Moment in the History of Money

Money is not just a means of exploitation; it also has redemptive qualities, particularly as a mediator between persons and society. Money – and the markets it sustains – is itself a human universal, with the potential to be emancipated from the social engines of inequality that it currently serves. In the late 90s, I asked what future generations will be interested in about our times and settled on the development of communications linking all humanity. This has two striking features: first, it is a highly unequal market of buyers and sellers fuelled by a money circuit that has become detached from production and politics; and second, it is driven by a digital revolution whose symbol is the internet, the network of networks. Since then I have explored how the forms of money and exchange are changing in the context of this communications revolution.⁴

Money has acquired its apparent pre-eminence because the economy has been extended rapidly from a national to a global level with much less social regulation than existed before. Of course, the specialists in money used their newfound freedom from post-war social democracy to loot the world in scandalous ways that we will have to repair, if we can. But, in addition to drawing people *en masse* into unsustainable credit

3. Chris Hann and Keith Hart, *Economic Anthropology: History, Ethnography, Critique*, Cambridge: Polity, 2011.

4. Keith Hart, *The Memory Bank: Money in an Unequal World*, London: Profile, 2000.

schemes, they also began to put in place some of the institutional mechanisms that could make markets work for all of us and not just for those with lots of money. Capitalism clearly is instrumental in making world society. It is unlikely to be the basis for its stable functioning, but it does get us some of the way there.

It is always dangerous when the economy is temporarily extended beyond the reach of normal society, especially when social frontiers are pushed rapidly outwards. Our times could be compared with previous episodes in the history of global capitalism, such as the dash to build continental railroads, the gold strikes in California, Alaska, and South Africa or the wild rubber boom of the mid- to late-19th century. Many analogous episodes may be found in the mercantilist economies that emerged during the period 1500-1800. The quick wealth and cowboy entrepreneurship we have witnessed were made possible by the absence of regulation in a period of global economic expansion. We now have an opportunity to consider how world markets might be organized in the general interest.

The residue of previous booms and busts included transport and communication systems; a mildly inflationary gold standard; new industrial uses for rubber; stock markets, and banking regulations. All the founders of modern social theory believed that the extension of society to a more inclusive level has positive features. The world economy is more integrated than it was even two decades ago; but we need new forms of political association capable of administering more effective regulatory frameworks. Fragmentation would be a disaster; but some would say it has already begun. I would not wish to return to currency controls and state-managed money, even if they were feasible. Clearly the political questions facing humanity today concern distributive justice above all. The long period of Western dominance of the world economy is coming to an end. New actors on the world stage will have their say about who gets what. An escalation of war and general fractiousness is quite likely under these circumstances. A focus on the socially redemptive qualities of money and markets might then be quite salutary.

The current crisis of world economy is not merely financial, a phase in the historical cycle of credit and debt. The removal of political controls over money in recent decades has led to a situation where politics is still mainly national, but the money circuit is global and lawless. The crisis should rather be seen as an irreversible moment in the history of money, occasioned by the collapse of the money system that the world lived by in the 20th century. This has been unraveling since the U.S. Dollar went off gold in 1971, a new regime of floating currencies emerged, and money derivatives were invented. As the need for international cooperation intensifies, the disconnection between world economy and national political institutions makes finding effective solutions very difficult.

There is still a tendency to see the potential disaster we are living through in economic rather than political terms. In this respect, neoliberalism's detractors often reproduce the free market ideology they claim to oppose. The Euro is by no means the only symptom of this crisis, but it may still come to be seen as the decisive nail in the coffin of the world economy today. We need to ask not what is beginning, but what is ending. This is not straightforward. What is ending is 'national capitalism', the synthesis of nation-

states and industrial capitalism.⁵ Its main symbol has been national monopoly currency (legal tender policed by a central bank). It was the institutional attempt to manage money, markets and accumulation through central bureaucracy within a cultural community of national citizens. It was never the only active principle in world political economy: cities, regional federations, and empires are at least as old or much older.

People learn to understand each other as members of communities; they share meanings as a way of achieving their practical purposes together. Money is an important vehicle for this. Nation-states have been so successful in a relatively short time that it is hard for us to imagine society in any other way. Five different types of community came together in the nation-state:

- *political community*: a link to the world and a source of law at home;
- *community of place*: territorial boundaries of land and sea;
- *imagined or virtual community*: the constructed cultural identity of citizens;
- *community of interest*: subjectively and objectively shared purposes in trade and war;
- *monetary community*: common use of a national monopoly currency.

The rise and fall of single currencies is therefore one way of approaching national capitalism's historical trajectory. At present national politics and media frame economic questions in such narrow terms that we find it hard to think about the world as a whole. But money is already global in scope and the need to overcome this limitation is urgent.

From Singular to Plural Monies

Mainstream economics says more about what money does than what it is. Its main function is held to be as a *medium of exchange*, a more efficient lubricant of markets than barter. Another school emphasizes money's function as a *means of payment*, especially of taxes to the government and hence on 'purchasing power'. It is also a *standard of value* or unit of account, with the focus again on government's role in establishing the legal conditions for trade; while John Locke conceived of money as a *store of wealth*, a new form of property that allowed the accumulation of riches to escape from the limitations of natural economy.

Karl Polanyi argued that only modern money combines the four functions (payment, standard, store, and exchange) in a few 'all-purpose' symbols, national currency.⁶ Although his analysis was intended just to illuminate the history of money, Polanyi's approach offers profound insight into the causes of today's global economic crisis. Our challenge is to conceive of society once more as something plural rather than singular, as a federated network rather than as a centralized hierarchy, the nation-state. The era of national monopoly currencies is very recent (from the 1850s); it took the United States, for example, half a century to secure an uncontested monopoly for its 'greenbacks'; and 'all-purpose money' has been breaking up for four decades now, since the Dollar left gold.

5. Keith Hart, 'Money in the Making of World Society', in Chris Hann and Keith Hart (eds) *Market and Society*. Cambridge: Cambridge University Press, 2009, pp. 91-105.

6. Karl Polanyi, 'Money Objects and Money Uses', in *The Livelihood of Man. Studies in Social Discontinuity*, New York: Academic, 1977 (1964).

Since the end of the Bretton Woods system of fixed parity exchange rates, world economy has reverted to the plural pattern of competing currencies that was normal before central banks learned how to control national economies in the late 19th century. One aspect of the present crisis is that the international rule system imposed after World War II was subverted by the creation of an offshore banking system which brought the informal economy to the heart of global finance.⁷ The separation of functions between different types of monetary instruments was also crucial to money's great escape from the rules of the Keynesian consensus. Central bank control has been eroded by a shift to money being issued in multiple forms by a global distributed network of corporations of many kinds, not just governments and banks.

Georg Simmel considered money's twin anchors to be its physical substance (coins, paper, etc.) and the social institutions supporting the community of its users.⁸ He predicted that the first would wither away, making the second more visible. Simmel's prophecy has been realized to a remarkable degree, as the digital revolution accelerates and cheapens electronic transfers. But if the essence of money is its use in a community with shared social institutions, globalization has made national capitalism seem a lot less self-sufficient than it did a century ago. Radical reductions in the cost of transferring information have introduced new conditions for engagement with the impersonal economy. The replacement of single currencies by numerous types of more specialized monetary instruments is one inevitable result of this.⁹

We must therefore move from singular (national) to plural (federal) conceptions of society. The infrastructure of money has already become decentralized and global, so a return to the national solutions of the 1930s or a Keynesian regime of managed exchange rates and capital flows is bound to fail. But the extension of economy beyond national boundaries is fraught with danger. We also need to extend systems of social rights to the global level before the contradictions of the market system collapse into world war – but local political organization resists such a move. At the same time, ours is becoming a multi-polar world marked by a variety of political forms and an income distribution that is much less divergent than during the age of European imperialism.

A Global Power Struggle

We are witnessing a global power struggle of awesome consequences and we cannot afford to stand to one side. The parallels with 1914 are striking. A global hegemon in decline, the United States (then Britain) confronts a rising challenger, China (Germany), while some regional powers are failing – Europe, Japan (Austria-Hungary, the Ottomans) – and others flex their muscles, India, Russia, Brazil (U.S., France, Japan). Money is at the heart of this struggle: the U.S. Dollar, currency wars, BRICS vs. the Bretton Woods institutions; but conventional economics does not help ordinary people to grasp what is going on. By studying monetary relations on different geographical scales, from intimate encounters to foreign exchange markets, we can help create

7. Nicholas Shaxson, *Treasure Islands: Tax Havens and the Men Who Stole the World*, New York: Vintage, 2011.

8. Georg Simmel, *The Philosophy of Money*. London: Routledge, 1978 (1900).

9. Paul H. Dembinski and Christophe Perritaz, 'Towards the Break-up of Money: When Reality Driven by Information Technology Outshines Simmel's Vision', *Foresight* 2.5 (2000): 483-97.

new meanings and connections between everyday life and the human predicament as a whole.

Through the internet or phone network, we can now span the world and connect personally with people whom we will never meet. Humanity has universal media for the expression of universal ideas. Money is essential to their dissemination. It is a constitutive part of our multiple-layered identities, from the most intimate relations to communities of exchange on a vast scale. Money allows us to express ourselves and indexes our place in hierarchies, solidarities, and enclosures. Our identities expand, fragment, and recombine as we move from the most local transactions to national or regional currencies. Central banks, insurance companies, pension funds, global and local banks, savings clubs, and other local credit schemes, all shape the possibilities for our personalities to develop. We learn about politics and our membership of larger groups by participation in monetary networks that exclude and entrap us even as they extend our horizons. As Marcel Mauss knew, the idea of society itself is reshaped by this multifarious expansion.¹⁰ If we hope for a more peaceful and integrated world society, money will certainly play an important role in its recovery from the present impasse.¹¹

The economy always has two faces, being pulled both inwards to secure local guarantees of a community's rights and interests and outwards to engage with foreigners through the medium of money and markets of various sorts – not just the sort we are familiar with. The idea of world society is still perceived by most people as at best a utopian fantasy or at worst a threat. We need to build an infrastructure of money adequate to humanity's common needs, although this agenda seems impossibly remote right now. One move in this direction goes by the name of 'alter-globalization' and the idea of a human economy offers a bridge to that movement.¹²

Money in a Human Economy

At the University of Pretoria we have organized a research team to develop a 'human economy' approach.¹³ Our first basic method is inspired by the ethnographic revolution that launched social and cultural anthropology in the 20th century. A class of academics chose to break out of the ivory tower and join the people where they live in order to discover what they do, think, and want. Second, the economy is always plural and people's experience of it across time and space has more in common than the use of contrastive terms like 'capitalism' or 'socialism' would suggest. This approach addresses the variety of particular institutions through which most people experience economic life. Third, our aim is to promote economic democracy by helping people to organize and improve their own lives. Our findings must therefore ultimately be presented to the public in a spirit of pragmatism and made understandable for readers' own practical use.

10. Marcel Mauss, *Écrits politiques*, M. Fournier (ed.) Paris: Fayard, 1997; Keith Hart, 'Marcel Mauss's Economic Vision, 1920-1925: Anthropology, Politics, Journalism', *Journal of Classical Sociology* 14.1 (2014): 34-44.

11. Keith Hart and Horacio Ortiz, 'The Anthropology of Money and Finance: Between Ethnography and World History', *Annual Review of Anthropology* 43 (2014): 465-482.

12. Geoffrey Pleyers, *Alter-Globalization: Becoming Actors in A Global World*, Cambridge: Polity, 2010.

13. See Keith Hart, Jean-Louis Laville, and Antonio Cattani (eds) *The Human Economy: A Citizen's Guide*, Cambridge: Polity, 2010, <http://www.up.ac.za/human-economy-program/>, <http://thehumaneconomy.blogspot.com/>.

All of this is compatible with a humanist view of the economy. It must be so, if the economy is to be returned from remote experts to the people who are most affected by it. But humanism by itself is not enough. The human economy must also be informed by a vision capable of bridging the gap between everyday life (what people know) and our common predicament, which is inevitably impersonal and lies beyond the actor's point of view (what we don't know). For this purpose a variety of methods must be drawn from philosophy, world history, literature, and grand social theory. Globalization is clearly reversible and we have to extend our normal reach to address its contradictions. We urgently need to make a world where all people can live together. Small may be beautiful and a preference for initiatives grounded in local social realities is unchallengeable, but large-scale bureaucracies, whether governments, cities or business corporations, are also essential if our aspirations for economic democracy are to embrace the movement of the world we live in.

So a human economy approach must somehow bridge the gap between everyday life and a world driven by forces that most people cannot imagine. But, given our preference to anchor economic strategies in people's everyday lives, their aspirations and their local circumstances, the intellectual movement involved should be conceived of as being one of *extension* from the local towards the global. We can't arrive instantly at a view of the whole, but we can engage more concretely with the world that lies beyond local society. According to Mauss and Polanyi (founders of modern social theory too), the chief way of achieving social extension has always been through money and markets in a variety of forms. Without money, most people could not juggle the plethora of institutional factors in their lives. Money and markets are intrinsic to our human potential, not anti-human as they are often depicted. Of course they should take forms that are more conducive to economic democracy. It helps to recognize that money and markets span the extremes of infinite expansion and finite closure. As Simmel said, money reflects our human potential to make universal society.

The Human Economy idea may have its origins in small-scale informal activities and a humanist ideology, but effective resistance to the corporate takeover of world society will require selective alliances between self-organized initiatives on the ground and large-scale bureaucracies of the public and private kind. It will also require the development of global social networks of the sort from which our human economy program drew its impetus. The human predicament is impersonal; there are powerful anti-humanist forces in our common lives. So we have to build bridges between local actors and the new human universal, world society. To be human is to be a person who depends on and must make sense of impersonal social conditions. But in the struggle with the corporations, we need to be very sure that we are human and they are not. The drive for economic democracy will not be won until that confusion has been cleared up.

Heads or Tails Revisited

In my article 'Heads or Tails? Two Sides of the Coin', I argued following Polanyi¹⁴ that money is both a *token* of state authority and a *commodity* made by markets, at

14. Karl Polanyi, *The Great Transformation: The Political and Economic Origins of Our Times*, Boston: Beacon, 2001 (1944).

the same time an aspect of relations between persons and a thing detached from persons.¹⁵ States and markets are combined in national capitalism, but policy swings erratically between the two extremes. David Graeber has made a similar contrast between money as virtual credit and as currency or bullion to analyze the history of debt over the last five millennia. If money is the concrete symbol of our human potential to make universal society, we will first have to get past national capitalism as the 20th century's dominant social form.

Money, much as Durkheim argued for religion,¹⁶ is the principal means for us all to bridge the gap between everyday personal experience and a society whose wider reaches are impersonal. It is often portrayed as a lifeless object separated from persons, whereas it is a creation of human beings, imbued with the collective spirit of the living and the dead. Money, as a token of society, must be impersonal in order to connect individuals to the universe of relations to which they belong. But people make everything personal, including their relations with society. This two-sided relationship is universal, but its incidence is highly variable.¹⁷ Money in capitalist societies stands for alienation, detachment, impersonal society, the outside; its origins lie beyond our control (*the market*). Relations marked by the absence of money are the model of personal integration and free association, of what we take to be familiar, the inside (*home*). People want to integrate division, to make some meaningful connection between their own subjectivity and society as an object. It helps that money, as well as being the means of separating public and domestic life, was always the main bridge between the two. That is why money must be central to any attempt to humanize society. It is both the principal source of our vulnerability in society and the main practical symbol allowing each of us to make an impersonal world meaningful.

The reality of markets is not just universal abstraction, but this mutual determination of the abstract and the concrete. If you have some money, there is almost no limit to what you can do with it, but, as soon as you buy something, the act of payment lends concrete finality to your choice. Money's significance thus lies in the synthesis it promotes of impersonal abstraction and personal meaning, objectification and subjectivity, analytical reason and synthetic narrative. Its social power comes from the fluency of its mediation between infinite potential and finite determination. To turn our backs on markets and money in the name of collective as opposed to individual interests reproduces by negation the bourgeois separation of self and society. It is not enough to emphasize the controls that people already impose on money and exchange as part of their personal practice.¹⁸ That is the everyday world as most of us know it. We also need ways of reaching the parts of the macro-economy that we don't know, if we wish to avert the ruin it could bring down on us all.

It is, however, no longer obvious, as it was for Mauss, Polanyi, and Keynes, where the levers of democratic power are to be located, since the global explosion of money,

15. Keith Hart, 'Heads or Tails? Two Sides of the Coin', *Man* 3.21 (1986): 637-56.

16. Emile Durkheim, *The Elementary Forms of the Religious Life*, Glencoe, IL: Free Press, 1965 (1912).

17. Keith Hart, 'Money is Always Personal and Impersonal', *Anthropology Today* 23.5 (2007): 16-20.

18. Jonathan Parry and Maurice Bloch (eds) *Money and the Morality of Exchange*, Cambridge: Cambridge University Press, 1989; Viviana A. Zelizer, *The Social Meaning of Money*, New York: Basic Books, 1994.

markets, and telecommunications has severely exposed the limitations of national frameworks of economic management. Before long, a genuine revival of Keynesian redistributive politics seems to be inevitable. But the imbalances of the money system are now global.

Polanyi explained the world crisis of the mid-20th century as the outcome of a previous round of what we would call 'globalization'.¹⁹ There are substantial parallels between the last three decades and a similar period before 1914. In both cases, market forces were unleashed within national societies, leading to rapid capital accumulation and an intensification of economic inequality. Finance capital led the internationalization of economic relations, and people migrated in large numbers all over the world. Money seemed to be the dominant social force in human affairs; and this could be attributed to its greater freedom of movement as the boundaries of society were extended outward — then by new means of transport and communication and colonial empire, now by the digital revolution and transnational corporations. The main difference is that the late 19th century was driven by a bureaucratic revolution which led to the centralization of politics and production; whereas a century later these same bureaucracies are being dismantled by a neoliberalism powered by the digital revolution in communications. Moreover, the immediate winner of 'the second thirty years' war' (1914-1945) was a social democratic version of national capitalism, the same system that has been unravelling for four decades now. Finally, the United States' overwhelming monopoly of the global means of destruction, the supremacy of the dollar as world currency, and its corporations' dominant supply of the hardware, software and content of the internet economy suggest that its vulnerability today is somewhat less than Britain's a century ago.

Money opens up local societies to interdependence with foreigners, but the pressure to reassert local control persists. Hence the internal and external dimensions of economy are often in conflict. National capitalism turned away from the world in an era of war and disruption of trade into an aspiration to self-sufficiency whose symbol was national currency. On a much smaller scale community currencies of the LETS type reject money's capacity to link us to universal society in favor of local restrictions on exchange.²⁰ Even Simmel believed that the dematerialization of money would reveal to us our dependence on society in the Durkheimian form of a singular state. All we know now is that the economy is global and lawless, while national capitalism is in full collapse. It would be no surprise if we are entering another age of war and revolution, comparable to that of 1914-1945, the last time that several decades of financial globalization ended.

We are not entitled, of course, to assume that neoliberalism is played out.²¹ Neoliberal privatization and the invasion of money into public and domestic life continue unabated. The penetration of finance into everyday reproduction poses problems that should be addressed through developing alternative approaches to money, not by denying its

19. Polanyi, *The Great Transformation*.

20. Jerome Blanc, 'Community and Complementary Currencies', in Keith Hart, Jean-Louis Laville, and Antonio David Cattani (eds) *The Human Economy*, Malden and Cambridge: Polity, 2010, pp. 303-312.

21. Philip Mirowski, *Never Let a Serious Crisis Go to Waste*, New York: Verso, 2013.

central role in the organization of complex societies. The attempt to separate spheres of paid and unpaid labor ('the market' vs. 'home') was always unrealizable and is in any case negated by money's indispensability to both.

Money is a great equalizer, but it also fuels inequality. I have long insisted that money is both personal and impersonal, subjective and objective, analytical and synthetic: and this is related to its ability to mediate the extremes of human experience. Money as memory links individual and community, past, present and future, science and story, local and global.²² We must resist the temptation to perch on one pole of these paired categories, learning rather how to think dialectically through them and to begin to work out practical ways of combining them socially.

The two great memory banks are language and money. Anthropologists have paid much attention to the first, which divides us more than it brings us together, but not to money whose potential for universal communication is less ambiguous, in addition to its well-advertised ability to symbolize differences between us. Exchange of meanings through language and of objects through money are now converging in a single network of communication, the internet. We must learn how to use this digital revolution to advance the human conversation about a better world. Our political task is to make a world society fit for all humanity. Money is how we learn to be truly human.

A Note on Historical Periodization

Finally, I present a historical periodization of the last two centuries or more, to show that the present rupture opens up the prospect of several decades of turbulence. The current crisis is often compared with the 1930s, but the Great Depression was part of a sequence launched when three decades of financial globalization were interrupted by the outbreak of war in 1914.

1776 – 1815	Age of war and revolutions
1815 – 1848	Industrial revolution
1848 – 1873	Origins of national capitalism
1873 – 1914	First age of financial globalization
1914 – 1945	Second age of war and revolutions
1945 – 1979	Golden age of national capitalism
1979 – 2008	Second age of financial globalization
2008 – ...	Third age of war and revolutions?

This is not a prophecy that the outcome of the present global crisis will be inevitably dire, but rather an invitation to public debate at a more serious level than is usual which may help us to avoid or at least prepare for such an outcome.

I have suggested here that the extension of society to a more inclusive level has some positive features and, before we demonize money and markets, we should try to turn them to institutional ends that benefit us all. We need new principles of political association with which to put in place more effective regulatory frameworks. This means addressing squarely the new combinations of money, machines, and people emerging

22. Keith Hart, *The Memory Bank*.

today. In order for that to come about, however, we have to be weaned from old social structures and habits of mind that have not yet been fully destroyed, as they would be by a period of general war of the kind that has accompanied all the major revolutions of modern history.

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IS THERE LIFE BEYOND MONEY?

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IS THERE LIFE BEYOND MONEY?

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What is the price of Experience? Do men buy it for a song?
Or wisdom for a dance in the street? No, it is bought with the price
Of all that a man hath, his house, his wife, his children
Wisdom is sold in the desolate market where none come to buy
– William Blake

I'm far from being an expert in the field of finance. So I should explain why I'm writing on the subject of money. The problem is that money invaded the space of everyday life, spreading far beyond the mere space of the economy, and turning into a sort of all pervading fluid.

The expanding pervasiveness of the economic sphere in social life is a marking feature of modern capitalism, after the dissolution of the traditional forms of subsistence economy. The expanding pervasiveness of money in the economic sphere is the marking feature of contemporary financial capitalism that can be named semiocapital, simply because signs take the prominent place in the process of production. Money is certainly a sign, and this sign has a history. While in the past of industrial capitalism it was a referential sign, representing a certain amount of physical things – today it is a self-referential sign that has acquired the power of mobilizing and dismantling the social forces of production. Since the end of the fixed regime of monetary exchange, the arbitrary game of financial speculation has taken the central place of the global economy: the consequence is the aleatority of every relation between things, and the precarization of every relation between persons.

One after the other every space of daily life – learning, affection, sex – is invaded by the brutality of the arbitrary power of money, and the undifferentiated abstraction swallows every dimension of experience, depriving it of its special flavor and concreteness. This is why the discourse on money can no longer be reserved to the experts in financial science; this is why I'm going to discuss money and finance.

While money has turned into the gate of access to any kind of experience, the access to money has become more and more difficult for the majority of people: precarity and unemployment spread all over, particularly among young people. Neoliberal privatization strips a large part of society of welfare, forcing people to fight for the elementary requirements of survival.

At a certain point, particularly in the wake of the financial collapse of September 2008, many people who, like me, do not have any special interest in financial science have been obliged to try to understand the incomprehensible words of the financial agents

in order to try and resist the aggression that the financial abstraction was waging against our concrete lives.

At the beginning of the new century the so called dotcom crash dissolved the illusion of an alliance between cognitive workers and venture capital, the alliance that in the 90s has made possible the creation and spread of the net. After the first crisis of the virtual economy in the year 2000, disempowered cognitive workers entered the cycle of precarization. Then the society at large was attacked by the menace of a meta-physical debt.

At the end of the 90s Jean Baudrillard wrote:

The debt will never be paid. No debt will ever be paid. The final counts will never take place. If time is counted, the missing money is beyond counting. The United States is already virtually unable to pay, but this will have no consequence whatsoever. There will be no judgment day for this virtual bankruptcy. It is simple enough to enter an exponential or virtual mode to become free of any responsibility, since there is no reference anymore, no referential world to serve as a measuring norm.¹

The prediction of Baudrillard proved false: the orbitalization of the debt has failed. The debt, which was in orbit around the globe has fallen down, and is haunting the economy of the West. Facing the de-orbitalization of the debt, the financial class multiplied the attempts to create value from nothing. But in order to do that, the financial class is turning the products and institutions of social activity into nothing. A sort of black hole began to swallow the richness produced in the last two hundred years, particularly in Europe. The credit derivatives market is the place where destruction replaces production. Since the '80s, when 'futures' became commonplace in the deregulated financial markets, financial agencies have started to invest their money in a paradoxical way: if they win they cash money, if they lose they cash more money from insurances on credit default swaps and similar financial tricks.

The old industrial model of accumulation was based on the cycle M-G-M (Money-Goods-more Money). The new financial model of accumulation is based on the cycle M-P-M (Money-Predation-more Money), which implies the following: Money-Social impoverishment-more Money. This is the origin of the black hole that is swiftly dissipating the legacy of industrial labor and of the very structures of modern civilization. As an attractor and destroyer of the future, financial capitalism is capturing energies and resources and transforming them into monetary abstraction: nothing. In 2008, financial emergency was declared after the collapse of the American derivative market and of Lehmann Brothers: as a consequence society at large was forced to pay for the reckless dissipation brought about by these financial dynamics.

In the wake of the 2008 breakdown a wave of movements spread in many cities of the world, creating new expectations. While the financial abstraction was swallowing the

1. Jean Baudrillard, 'Global Debt and Parallel Universe', trans. Francois Debrix, *Liberation Paris*, 15 January 1996.

life and future of the new generation, a movement of unprecedented extent exploded reaching a peak in the year 2011. The London riots of November 2010, the Spanish *acampada* of May and June 2011, and the Greek resistance of students, precarious workers, artists, and intellectuals tried to overthrow the financial dictatorship. In vain.

In the Spring of 2011 the Arab cities saw a large uprising of young people against local dictators and global financial capitalism, but the movement of precarious cognitive workers, the avant-garde of the Egyptian and Syrian rebellions, proved unable to lead a long lasting democratic transformation of their countries, and the process was hijacked and diverted by all kinds of identitarian fanaticism.

In September 2011 the uprising exploded in New York City, the very heart of financial globalism. The outburst of Occupy Wall Street was followed by a fresh wave of occupations aimed at the reactivation of the social body of cognitive precarious labor. The global uprising has obviously involved different social forces according to the diversity of the areas where it erupted, but precarious cognitarians mobilized everywhere giving the global process a common character and meaning. The search for autonomy of knowledge and technology to escape from the grip of financial capitalism is the common content of the cognititarian forces, which are the innovative core of the uprising.

Everywhere cognitive workers – students, researchers, journalists, artists, and programmers – have been at the frontline of the mobilization, precariousness has been their main concern everywhere, and autonomy of knowledge and technology has been their main issue. The attempt to resist and subvert the corporate capture of knowledge and skills has thus been the defining novelty of this movement. Media-activism, the development of P2P technologies, and the experimentation with alternative currencies can be viewed as examples of the attempt to re-appropriate the product of knowledge, while the occupation of spaces – the overall process named Occupy – has been the example of a process of recomposition of the erotic body of society trying to connect with the cognitive potency of the general intellect.

In the days of Spring 2011, with a group of students and professors of the Academy of Brera, I went to the Milano Stock Exchange building, and together we occupied that space. The police came, and forced us out. Then we occupied the square where the beautiful monument by Maurizio Cattelan is raising the middle finger towards the sky just in front of the temple of finance.

In the air there was the expectation of an uprising, of a wave of solidarity and resolve to stop capitalist aggression. Provided that in the future there will be people who can remember, the year 2011 will be recorded as the year of an enigmatic insurrection, an insurrection full of rage and indignation but devoid of solidarity and perseverance, an uprising that immediately after gave way to the sentiment of a deep rooted impotence. Notwithstanding many scattered events of protest and revolt, the movement proved unable to unite in a general European upheaval, and finally pulled back, and sunk in the livid waters of depression where we are at the moment. This is why a non-expert like me dares to speak about a highly specialized subject as the adventures of money; the best way to speak of financial matters nowadays is to start from an understanding of the effects that monetarism has provoked on work and society.

Money and Work

'The workday is not an extension of human nature; long working hours are not rooted in need and are not something that workers have willingly, freely or joyfully agreed to...' ²

My point of view will be the recent history of work, particularly the imposed extension of work time. In *The New York Times* columnist Frank Bruni wrote the following, referring to the recent surge in American employment rate, after the crisis that followed the 2008 financial collapse: 'The new jobs don't feel as sturdy as the old ones. It takes more hours to make the same money or support the same lifestyle. Students amass debt. Upward mobility increasingly seems a mirage, a myth.' ³

It takes more hours to make the same money. This is the crucial transformation that is a result of the neoliberal policy, and has been pushed by the financial class. Western workers are working more and more and earning less and less.

In 1998 Aronowitz and Cutler already wrote in *Post-Work*:

We can understand the political history of the last thirty years in terms of the largely successful effort of the Right to impose social amnesia on the American people, to snuff out the memory of a time we began to seriously consider a post work future. Organized labor has given up its historical demand for shorter hours at no reduction of pay and has instead come to accept the thinking that shorter hours involves a reduction in total wages. Labor has abandoned its engagement in the struggle for control over the workday. People no longer imagine the possibility of the end of work. The workaholic model, once regarded as an individual pathology, has become the enforced, ethically approved standard: the workday has again become the central feature of human existence. ⁴

In the last decades – since Margaret Thatcher's rise to power in the United Kingdom – the workers of the world have been subjected to the most ferocious aggression imaginable. The factory workers in the early 20th century had negotiated the reduction of work time, and in the 1960s and 70s the alliance between factory workers and knowledge workers opened the way to general automation of production and emancipation of human life from the chains of work. The neoliberal reversal of the scene, since the late 70s, has marked the beginning of a never-ending class war waged by capitalists against society and against workers.

Democracy, friendship, and the pleasures of life have been trashed during this war.

In the aftermath of the First World War, in the days of Roosevelt's New Deal, the emancipation of social time from the unnecessary (less and less necessary) daily obligation of salaried work began to be envisioned as a possibility. In the decades prior to the worldwide movement of '68, many believed the eight-hour day was just the beginning of the struggle to reduce working hours further. Time for education, time for self-care,

2. Stanley Aronowitz and Jonathan Cutler, *Post-Work*, New York: Routledge, 1998, p. 59.

3. Frank Bruni, 'Lost in America', *The International New York Times*, 27 August 2014.

4. Aronowitz and Cutler, *Post-Work*, p. 68.

time for friendship, affection and pleasure: this was the agenda of the age of democracy and progress. This was not a utopia, but the pragmatic expectation of conscious workers and progressive intellectuals in an era with large developments in new technologies for automation.

But the accumulation of value is based on the exploitation of human time, and power is based on the hierarchical division of social time, therefore capitalists and their ideological agents never lost sight of their goal: namely to re-establish ten or twelve hours hour work days as the cultural standard. They enforce discipline by any means: the black-mail of misery, the violence of war, and the pervasive potency of advertising, ideology and consumerism. As Aronowitz and Cutler write: 'consumption was created as a new motive: a new human nature was constructed around an insatiable need to shop and accumulate commodities of all kinds.'⁵

The cultural reduction of individual needs and habits to uniformity, the mass production of material expectations and the massive commodification of desire is the totalitarian pre-condition of the process of subjection of social time to the dictatorship of work. The privatization of daily life – individual houses, nuclear families, private transportation – promoted as a condition of freedom has resulted in cultural manacles, the condition of a form of slavery which, blended with puritanical ideology, finally intoxicates life and culture and politics.

Elisabeth Kolbert argues:

According to Keynes the size of the global economy would increase sevenfold in the following century, and this, in concert with ever-greater "technical improvements", would usher in the fifteen-hour week. Keynes assumed that people work in order to earn enough to buy what they need. And so, he reasoned, as incomes rose, those needs could be fulfilled in ever fewer hours. Workers would knock off earlier and earlier, until eventually they'd be going home by lunchtime. But that isn't what people are like. Instead of quitting early, they find new things to need. Many of the new things they've found weren't even around when Keynes was writing – laptops, microwaves, Xboxes, smartphones, smart watches, smart refrigerators, Prada totes, True Religion jeans, battery-powered meat thermometers, those gizmos you stick in the freezer and then into your beer to keep it cold as you drink it. Suggestively, what's come to be known as the "long-hours premium" – the return that salaried employees effectively receive for each hour of work they put in beyond the usual forty – has more than doubled in the past thirty years.⁶

According to Joseph Stiglitz consumption choices become self-reinforcing. We 'learn how to consume by consuming,' he writes, and how to 'enjoy leisure by enjoying leisure'.⁷ Most people feel bad when they are not obliged to work all day long. They do not know what to do, because they have never learned what life might be in conditions of freedom.

5. Aronowitz and Cutler, *Post-Work*, p. 61.

6. Elisabeth Kolbert, 'No Time. How Did We Get So Busy?' *The New Yorker*, 26 May 2014, pp. 52-56.

7. Kolbert, 'No Time', p. 54.

Money is crucial in this process: money, in fact is a sort of universal *ersatz*: it is making life possible but simultaneously it is replacing life. In exchange for money people accept to give away their life. So what is money? Money is the tool that shapes life as a container of exchangeable time. Thanks to money our life can be translated in the language of universal exchange, but also in the language of accumulation of (exchanged) time.

Can we imagine the reversal of the function that money has historically fulfilled? Can we imagine, as some theorists have recently proposed, a sort of 'money of the commons'? The crucial function of such 'money of the commons' should be to reduce the workers dependence on the economic constraints that force them to accept any blackmail, and particularly force them to sell their labor time for an unfair salary in precarious conditions.

A Digression About Language and Money

Thanks to Wittgenstein I know that the limits of my language are the limits of my world.⁸ When we talk of 'limit' however we are dealing with two dimensions: what is here, inside the space of our limited world, and what is there, beyond the limit. The limit is the tangle in which our world is captured, and it is a linguistic tangle. How can we disentangle the possible from the present form of the world?

What Wittgenstein says about the limit of language has interesting implications at the political level: social communication is limiting the range of political imagination. What we cannot imagine we cannot do, and we cannot imagine what is excluded from the field of the expressible. Money, by this point of view, can be considered as a formidable limit to our imagination.

According to Marx money is the general equivalent, the translator of any thing into every other thing. In some parts of his work (namely in the *Grundrisse*) Marx suggests that money is not only a signifier, whose signified is infinitely varied, but is also an engine, a source of energy that transcends referentiality and measurability.

Since French and Russian Symbolists declared that the intention of the poet is not to describe but to evoke, the late modern poetry revolution is based on the emancipation of the sign from the referent. Mallarmé's words are no longer intended to designate the real, but are intended to evoke the real, to make the real emerge from nothingness. Virtual technology has made real the old Symbolist dream of evocation, in many ways. The monetary sphere in the second part of the 20th century becomes a force of evocation, a magical circulation of something that does not exist.

The current financialization of the economy demands self-referentiality of the monetary system as a condition. In fact, financial accumulation is essentially based on the automation of the relation between financial algorithms and the dynamics of production and exchange. The financial function (which once upon a time was dependent on the general interests of capitalism) has now become the automated language of the economy, a sur-codification, which is subjecting the sphere of reality (production and exchange) to a mathematical rationale that is not inherent to the rationale of production itself.

8. Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, Mineola: Dover Publications, 1998 (1921).

Nixon's decision in 1971 to emancipate the American dollar from the universal regime of fixed exchange, presumed that the financial variable is independent from any referent, and is only based on the arbitrary power of self-regulation and self-affirmation. The creation of the digital web paved the way to the automation of the relation between financial code and economic dynamics, and therefore social life was subjected to financial semiotization.

Chomsky's structural theory is based on the idea that linguistic signs can be exchanged in a bank of shared structures: a common cognitive competence makes the exchange possible. Language is therefore, like money, a general equivalent and universal translator of different goods. We can exchange everything with money, as we can exchange everything with words.⁹

But money (like language, of course) is also a tool for the mobilization of energies, a pragmatic act of self-expansion. In the sphere of financial capitalism money is less an indicator than a factor of mobilization. It is suitable to provoke participation or submission. Look at the reality of debt, look at the awful effects of impoverishment and exploitation that debt is provoking in the body of society. Debt is a transformation of money into blackmail. Money, which was supposed to be the measure of value, has been turned into a tool for psychic and social subjugation. This metaphysical debt is linking money, language, and guilt. Debt is guilt, and as guilt it is entering the domain of the unconscious, and shaping language according to structures of power and submission.

Language and money have something in common: from a physical point of view they are nothing, yet they move everything in human history. Words move people to believe, words create expectations and the impulse to act in the pursuit of their goals. Words are tools for persuasion and the mobilization of psychic energies. Money acts similarly, based on trust, on the belief that a piece of paper means everything that can be bought and sold in the world.

In 'Money The Poor Man's Credit Card', chapter fourteen of *Understanding Media*, Marshall McLuhan writes:

Money talks, because money is a metaphor, a transfer, and a bridge. Like words and language, money is a storehouse of communally achieved work, skill, and experience. Money, however, is also a specialist technology like writing; and as writing intensifies the visual aspect of speech and order, and as the clock visually separates time from space, so money separates work from the other social functions. Even today money is a language for translating the work of the farmer into the work of the barber, doctor, engineer, or plumber. As a vast social metaphor, bridge, or translator, money – like writing – speeds up exchange and tightens the bonds of interdependence in any community.¹⁰

9. Noam Chomsky, *Syntactic Structures*, Mouton, 1957; *Aspects of the Theory of Syntax*, Cambridge: MIT, 1975.

10. Marshall McLuhan, *Understanding Media: The Extensions of Man*, Toronto: McGraw Hill, p. 7.

Money is a tool for the simplification of social relations, and it makes possible the automation of acts of enunciation. While the industrial automaton was mechanical and thermodynamical and consisted, as Marx writes in *Fragment on Machines*, 'of numerous mechanical and intellectual organs so that workers themselves are cast merely as its conscious linkages', the digital automaton is electro-computational, involves the nervous system, and unfolds in networks of electronic and nervous connections. The bio-informational automaton is the product of the insertion of the digital automaton in the flow of socio-linguistic interactions.

Abstraction and Automation

Abstraction is the main trend of the last century in the field of art, language, and the economy. Abstraction can be defined as the mental extraction of a concept from a series of real experiences, but it can be also defined as the separation of the conceptual dynamics from the bodily process. Since Marx spoke of 'abstract labor' in order to refer to the working activity as separate from the useful production of concrete things, we know that abstraction is a powerful engine. Thanks to abstraction, capitalism has detached the process of valorization from the material process of production. As productive labor turns into a process of info-production, abstraction becomes the main source of accumulation, and the condition of automation. Automation is the insertion of abstraction into the machinery of social life, and consequently it is the replacement of an action (physical and cognitive) with a technical engine. From the point of view of cultural history the first part of the 20th century is marked by the emancipation of the sign from its referential function: this may be seen as the general trend of late modernity, the prevailing tendency in literature and art as well as in science and in politics.

In the second part of the century, the monetary sign reclaims its autonomy, and since Nixon's decision, following the process of monetary deregulation, the arbitrary self-definition of monetary dynamics is established: money shifts from referential to self-referential signification. This is the condition for the automation of the monetary sphere, and for the submission of social life to this sphere of abstraction. Automation, which is electronic, does not represent physical work so much as programmed knowledge. As work is replaced by the sheer movement of information, money as a store of work merges with the informational forms of credit and credit cards.¹¹

Retracing the history of money, from exchange commodity to representative money to standard value to electronic abstraction, McLuhan writes:

The Gutenberg technology created a vast new republic of letters, and stirred great confusion about the boundaries between the realms of literature and life. Representative money, based on print technology, created new speedy dimensions of credit that were quite inconsistent with the inert mass of bullion and of commodity money. Yet all efforts were bent to make the speedy new money behave like the slow bullion coach. J. M. Keynes stated this policy in *A Treatise on Money*: Thus the long age of Commodity Money has at last passed finally away before the age of Representative Money. Gold has ceased to be a coin, a hoard, a tangible claim

11. McLuhan, *Understanding Media*, p. 41.

to wealth, of which the value cannot slip away so long as the hand of the individual clutches the material stuff. It has become a much more abstract thing – just a standard of value; and it only keeps this nominal status by being handed round from time to time in quite small quantities amongst a group of Central Banks.¹²

Only when it is abstracted (separated from the referent, and dis-embodied) can the monetary dynamics be automated and submitted to the rules of a non-referential sphere of signification and attribution of value. Information takes the place of things, and finance – which once upon a time used to be the sphere where productive projects could meet capital, and where capitals could meet productive projects, emancipates itself from the constraints of physical production: the process of capital valorization (increase of money invested) no longer passes through the creation of use value. As the referent is cancelled and financial accumulation is enabled by the mere circulation of money, the production of goods become superfluous. The accumulation of abstract value depends on the subjection of the population to debt, and on the predation of existing resources. This emancipation of capital accumulation from the production of useful things results in the dismantling of social welfare.

In the sphere of the financial economy, the acceleration of financial circulation and valorization implies the elimination of the concrete usefulness of products because the faster information circulates, the faster value is accumulated, and purely financial information is the fastest of things, while the production and distribution of goods is slow. The process of realizing capital, namely the exchange of goods with money, slows the pace of monetary accumulation. The same phenomenon happens in the field of communication: the less meaningful the message, the faster, given that meaning production and interpretation takes time, while the circulation of pure information with no meaning is instantaneous.

In the last twenty years computers, electronic exchanges, dark pools, flash orders, multiple exchanges, alternative trading venues, direct access brokers, OTC derivatives, and high-frequency traders have totally changed the financial landscape and particularly the relation between human operators and self-directing algorithmic automats. The more you remove references to physical things, physical resources, and the body, the more you can accelerate the circulation of financial flows. This is why at the end of this process of abstraction-acceleration value does not emerge from a physical relationship between work and things, but rather from infinite self-replication of virtual exchanges of nothing with nothing.

Alternative Currencies and the Automation Trend

Is it possible to undo the financial system from the inside? Is it possible to use money as a lever against the financial trap and against the obligation to precarious labor? Some open-minded techno-financial agents, and also groups of social activists are promoting the idea that alternative currencies can be useful in that sense.

The open minded financial agents are inspired by the libertarian persuasion that the economic sphere has to be free from the State, and from centralized monetary control.

12. McLuhan, *Understanding Media*, p. 41.

The social activists are looking for a possibility to democratize the financial sphere. Can the function of money be subverted? Can money be used as a tool for disentangling social life and production from financial capitalism, which is using the monetary dynamics as a tool for subsuming knowledge and work? Or should we rather come to the conclusion that money can only act as an automator, the essential automator of social life? In that case we should conclude that only by subtracting spaces of life from monetary exchange and codification can we overcome the limit of money, as a linguistic codification of time, activity and life.

The Occupy movement that exploded in many cities of the world in 2011 was essentially an attempt in deconstructing the financial automation of social life, an attempt in suspending the grip of the financial machine over the process of production and distribution of wealth. Despite its widespread effect at the symbolic level, despite its ability to denounce the dangers of financialization of the economy, the Occupy movement has been unable to fulfill its goal. The financial automation of social life, and the implied dismantlement of the welfare state and impoverishment of workers, seems unstoppable. So people have to find the means for defending their life, their education, their health. In the countries (like Greece, Spain, and Italy) that have suffered most from the financial aggression, people have experimented with forms of social self-help, mutual services, time banks, and alternative currencies.

Insolvency – the active refusal to pay debt and undeserved taxation, the refusal to pay for basic services, the permanent occupation of spaces and buildings, and the sabotage of austerity – is the most effective way to repel financial blackmail. But the organization of insolvency is only possible when social solidarity is strong, and in the present condition the links of solidarity are weak because of the precarization of work. Despite mass protests in the streets, people have not been able to keep solidarity alive in the long run. This is why insolvency has not really grown roots in the social scene during the last few years. Rudimentary forms of alternative currencies for local exchange have begun appearing in many places in Europe, adding to experiences like sharing time and basic services and goods. But community currencies can only become a significant form of exchange when social solidarity is strong enough to nurture trust and mutual help. More sophisticated forms of alternative currencies have recently been promoted by high skilled programmers: Bitcoin being the best known example. Generating money is a technical problem, but replacing financial money with alternative money is a problem of trust.

According to Giorgio Griziotti and Carlo Vercellone: ‘a money of the common should take into account three essential elements, hardwired into its algorithms and its implementation’:¹³

The impossibility to accumulate and thus impeding it from becoming the object of speculation. Consequently, it must lose some of its value over time. It would therefore be a currency that melts down, a ‘demurrage charged money’. Mitigating workers’

13. Griziotti Vercellone, ‘Biorank vs Commoncoin: Algorithms and Crypto-Currencies in the Bios of Cognitive Capitalism’, in *Quaderni di San Precario*, Vol. 8 (June 2014), <http://quaderni.sanprecario.info/2014/02/biorank-algorithms-and-transformation-in-the-bios-of-cognitive-capitalism-di-giorgio-griziotti/>.

dependency on the economic restrictions that force them to sell their labor power and therefore wage relations themselves; thus reducing precarity. Allowing, on these premises, for more free time and resources for developing alternative forms of cooperation based on the common pooling of knowledge, production and, in any case, on exchange networks that exclude the logic of profit. Participation in networks where a currency of the common circulates implies adhering to these principles, whether participants are individuals, businesses or institutional subjects, as in the case of certain alternative currency models experimented with on a local level.¹⁴

Alternative currencies can act as a game changer, this is quite possible, and it is already happening up to a certain point, but it is not clear how they can act as a surrogate for a lack of social solidarity. Algorithmic money may act as the ultimate tool for automation: automation of behavior, language, relation, automation of evaluation and exchange.

Regardless of the intentions of Bitcoin miners, their monetary action is going to heighten the level of automation in the sphere of social exchange. Coding personal relationships into a programming language is the tendency: cryptomoney and cryptocontracts are more and more turning the relations between people into the execution of a programming language, into a sequence of acts that one must accomplish in order to access the following step. The normative function of law is replaced by the automatic implication of human agents reduced to operational functions. The overcoming of the industrial system has been enabled by the translation of physical acts into information. The automation of linguistic interaction and the replacement of cognitive and affective acts with algorithmic sequences and protocols is the main trend of the current transformation.

Although we can expect a process of disruption of the monetary cycle from the inside, although alternative currencies and cryptomoney can play a role in the disarrangement of the monetary flow, it is difficult to guess how money, a tool for automation, can disentangle our life from the financial automation.

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14. Vercellone, 'Biorank'.

ON A POST- MONETARY NETWORK BASED ECONOMY

RALPH AND
STEFAN HEIDENREICH

ON A POST-MONETARY NETWORK BASED ECONOMY

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The love of money as a possession – as distinguished from the love of money as a means to the enjoyments and realities of life – will be recognized for what it is, a somewhat disgusting morbidity, one of those semi-criminal, semi-pathological propensities which one hands over with a shudder to the specialists in mental disease.

– John Maynard Keynes

Allocation, Distribution

The economy as a whole deals with allocating work and distributing goods. Both operations are based on relations between economic agents, objects, and humans. Who gets something and who has a task to do, is a question of matching. As such we have to deal with a network-centered problem that could theoretically be solved by network-based algorithms. Most likely there is no general problem solving routine that addresses tasks in a generalizing, universalist way. We have to make do with local solutions, or with interest-specific routines, or with a variety of algorithms embedded in an eco-system of diversified economies.

Throughout history, issues of distribution and allocation have been solved through money. But also before the introduction of money, goods were distributed and tasks were allocated according to different practices. As David Graeber has recently shown, many standard accounts on the history of a pre-monetary economy were wrong.¹ The narratives about the appearance of money were retrospectively arranged according to practices introduced by money itself. But the imagined societies based on barter exchange were never found. Also, the idea of private property was largely absent before money was introduced.

Like all other media, money is far from being a neutral tool. It shapes the way we perceive economic transactions. Rules that we take for granted today derived from the introduction of money, like the ideas of buying and selling, consistent valuation, or property. The history of economy can show that money was neither the beginning nor does it need to be the end.

Ideas about a post-monetary system do not necessarily need to look very utopian or far away. Already now, our situation is approaching a point at which very many services render money either obsolete or an avoidable obstacle. The monetary layer of our

1. See David Graeber, *Debt: The First 5,000 Years*, New York: Melville House, 2011, pp. 21-42.

economy is being carried along, as it facilitates the extraction of profits and allows to tie sharing and other collaborative practices to the schemes of the old economy.

What would be the advantages of a post-monetary economy? Having much more data at its disposal, a post-monetary algorithm may distribute and allocate much more directly and efficiently than a money-based market mechanism. Additionally, there is one important feature of our monetary system, that would be difficult to implement, and that is the accumulation of vast sums of wealth and the inequalities of income. Technically it might still be possible to tweak a post-monetary system to keep redistributing wealth to the rich, but morally those practices would be regarded highly doubtful systemic bugs.

Matching

The core routine of a money-free economy is the matching algorithm. Its main purpose is to make needs and capabilities meet. Matching is not to be confused with today's market mechanisms. It is not about setting a price. Prices are needed when information about the participants of the transaction, their needs and capabilities, is lacking. Under these constraints, the exchange at an abstract level replaces a match on the basis of needs. Money based markets operate on a high level of abstraction, and they involve very many institutions of production and services, that adapted to, mirror and create this level of abstraction.

On the contrary, without money and with abundant information, one could imagine a matching algorithm that addresses each economical agent and offers the opportunities and goods available. The domain of personal decisions, as far as they concern an economic relation to others, will then be accessed by the matching algorithm.

On the aggregate level, matching could aim for an optimal distribution. It is open to discussion what type of optimum counts as desirable, and if only one type of optimum has to cover the whole economy. One could also think of very many, even conflicting or competing solutions. Optimizing a network with complex links – bundles of desires and capabilities – may either aim at resource efficiency, or at an equilibrium of production and consumption within each agent, or at the overall benefit for a group or the society as a whole. Each solution comes with its own ethical settings. One could even go so far to say that each different economic procedure installs its suitable set of rules, frames it as morally correct behavior and codifies it as law.²

In this sense early monetary systems established their respective laws referring to property, stealing and the assignment of goods to persons; rules that were not needed under pre-monetary conditions. Setting the rules was governed by the same institutional bodies that also implemented the calendar for agriculture and the storehouses for seeds. Some facets of them survived in the shell institution of religion up to our present times. But also today, law making and public morals are narrowly affiliated with economic practices.

2. Bernard E. Harcourt, *The Illusion of Free Markets*, Cambridge: Harvard University Press, 2011, p. 241: 'In truth, however, the "liberalization" of markets and "privatization" of industries during portions of the nineteenth and twentieth centuries merely substituted one set of regulations, of governmental forms of rule-making, with other regulatory systems that merely favored a different sort of actors.'

The practical implication of an optimizing algorithm cannot be predicted. Emergent behavioral patterns tend to turn technical or governmental routines into a contingent playground. That in turn creates the need to implement etiquettes, guidelines, or sanctions. These dynamics count for economic processes no less than for all sorts of communication.

Money as Medium

Within the current economy matching is handled by markets mediated through money. Each good is assigned an owner and a price. The price is said to reflect the relation of demand and supply in the markets, but the market itself is an idealized site of optimal allocation and efficient information.³ But after all, it forms the core procedure of a monetary system of distribution and allocation. Its matching function operates at aggregated quantifications provided by money, and that creates a situation far from any optimum. Products and services are rather given triple or more to people in possession of money, than to the ones who actually would need it. Manipulation of demand and supply contributes to the inefficiency of markets. However, more dangerous and damaging turned out the inherent drive – not towards equilibrium as the classical theory postulates – towards exaggeration and instability.⁴

Usually, resistance against our current monetary regime starts with alternative currencies. But the overall scope of this approach remains entirely within models of monetary value and limits itself to the substitution of the issuers and institutions that regulate the rules and the circulation of money. Our economic thinking is so bonded with monetary exchange, that it requires quite a bit of imagination to shun the idea of the necessity of money altogether. To call into question the very idea of a general equivalent sounds like an implausible idea given the current conditions. How to measure value? How to construe a basis for exchange? Questions like these come to mind immediately, but they disregard the fact that the very idea of a unified value and an immediate exchange are linked to the monetary regime. As ethnographers have shown, economic relations can be built with the absence of both concepts. In other words: these concepts only appear with the ascent of money, and may not survive its end.

Early pre-monetary economies usually did not extend much over the clan, or the village, or a tribe. Their reach was severely hindered by the fact that the reach of transactions and memorized records was restricted to friends or friends of friends. Most objects did not circulate much beyond the local community within which all kinds of 'IOUs' had to be remembered.⁵ Seen from this perspective, the history of credit and money can be told as a story of record keeping, of databases, bookkeeping techniques and network complexity. For our purpose, it is sufficient to briefly sketch out the outlines of such a history.

3. See Karl Polanyi, *The Great Transformation*, Boston: Beacon Press, 2001 (1944), p. 171.

4. Hyman Minsky, *Stabilizing an Unstable Economy*, New Haven: Yale University, 1986 p. 106: 'What we seem to have is a system that sustains instability even as it prevents the deep depression of the past.'

5. Larry Randall Wray, *Credit and State Theories of Money: The Contributions of A. Mitchell Innes*, Cheltenham: Edward Elgar, 2004, p. 79.

Human memory has a limited capacity for keeping track of past transactions. Within a small village or a tribe, the collective memory of the members may be enough to record all mutual economic relations. But whenever the social entities become bigger, data traffic grows. Human memory does not scale very well when confronted with these challenges. The first writing systems, implemented by temples and other semi-economic institutions, were used to record huge numbers of past transactions. Religion may, in this respect, be understood as a belated moral justification of early bookkeeping practices and its laws and the roles assigned to the vigilantes of the pre-monetary exchange, its funding narratives and its cults of debt, forgiving, and indebtedness.

With early bookkeeping rose the extension of the economic empires. For the exchange with foreigners, and that means with agents outside of the range of local laws and records, new modes of transactions had to be invented. The main feature of this kind of exchange was to avoid extensive record keeping. After the transaction is done, both parties had to leave without mutual obligations. This erasing of memory was one of the main functions of money, which is commonly referred to as payment. For transactions money operates like a compression algorithm. The mapping of this ritual to minor transactions lead to our current daily social practice of monetary exchange. It made transactions amongst non-friends not only possible, but turned it into the economic standard.

Today, the compression function of money is no longer needed as the situation on the data side of economy has changed considerably. There is no longer a lack in technical memory and data capacities. Systems of distribution and allocation that once relied on friendship can be scaled to the global level with the help of digital data and networks. But there is no simple way back to pre-monetary practices, because a post-monetary system would face two additional requirements. It cannot be built from scratch, as we live in a functioning economic environment based on money. And second, it faces the challenge to be more efficient and to bring advantages over the old system in order to make people participate. Even as the old monetary regime becomes more and more inefficient, given the immense inequality it has to maintain, this is no easy task.

Conceptually, there are two different options for post-monetary economies. The first system would keep the agents as they are in place and would model a networked, data-driven process. The second approach would expand the set of economic agents and might then arrive at a surprisingly lean and elegant solution.

Data Transactions

Money can fully be replaced by memory, according to a paper by N. Kocherlakota, at least for certain types of economic systems.⁶ Keeping track of all transactions would allow for a system of bookkeeping that enables us to regulate an economy. But within a data driven system of this kind, underlying theoretical problems appear. A memory system would still have to operate on the basis of assigned values. It would not be able overcome money completely, but only codify it in different ways. Without abolishing the idea of a general equivalent, this practice would not be better than another money substitution, even if it were more sophisticated than very simple substitutive forms like Bitcoin.

6. Narayana R. Kocherlakota, 'Money is Memory', *Federal Reserve Bank of Minnesota*, Research Department Staff Report 218, October 1996.

When approaching the issue of economic transaction from the side of a matching algorithm, there is no need to calculate a value for a good. Sufficient conditions for its operation would be the ability to make decisions whether a desire is fulfilled, a task is assigned, or a product is delivered – whether a transaction takes place or not. Assigning value is only necessary when the transaction has to be mapped to a universal, all encompassing unit of measurement. We all know that this type of measurement does not correspond to our daily experience. Wishes and desires change. A thing may possess an immense value for one person, while another one perceives it as a waste. One might wish to have one and the same object at certain moment, and get rid of it at other times. From its very invention, the idea of a general value has been a fictitious form adapted to monetary exchange and markets.

It may require a completely different approach to solve the issue of economic circulation of needs from another angle. If a need is expressed, it can either be served, or it stays in the system as an open ticket. In case there is more demand than supply, the good would be ideally assigned to the person who needs it most, or who makes most out of it. This would be a relational value. At the same time a message is sent to whomever is willing and able to provide more of the same good. The basic communication around a transaction would consist in the activation of this network-based relation. A communication environment of this type is far from trivial. As it easily extends over a more than two connected positions, it tends to produce huge flows of data even for small transactions. How do we compare recursive factors like the degree of need or an expected productive use? How can the desires of one person trigger the needs of another one? What about the global impacts, like sustainability or climate efficiency?

Even the simplest relation can stretch over various links. Each transaction would then become an operation that entails the whole world like Leibnizian monades. It goes without further explanation that a data-driven system would generate huge amounts of information, with all the negative consequences of misuse, surveillance, and the rule of control regimes.

On the other hand, such an algorithm would help to prevent some of the injustices of our current regime. Just to give an example: why should a new flat be given to someone who has already five others, if there is someone who needs a flat to actually dwell there instead of keeping it empty as mere financial asset? Present day distributions, that routinely ignore needs and replace them by the law of the economically stronger, would be laid bare in all its moral doubtfulness. But not everything is distributed along these rules; there are plenty of non-monetary practices around. Just to give one example – in bars, beer is usually not served to the one who is willing to pay most.

Some of the perverse incentives coming with money were still obvious shortly after its introduction.⁷ But once the monetary regime had become the general rule, they appear to be the new normal.

7. See the Aristotelian characterization of wealth acquisition in Aristotle, *Politics*, I, 10, 1257b, trans. C.D.C. Reeve, Indianapolis: Hackett, 1998, p.16.

Ticklish Objects

The obstacles of a data rich exchange-oriented system may be overcome by reconsidering the participants in the market. Whomever or whatever partakes in an economic transaction may be regarded as an economic object, with its needs and desires and its own interests. This does not only refer to human beings, but also to all kinds of objects, even to objects in the sense of programmable objects, like events or communications. For each object included in a transaction, there should be an optimization function. A car wants to be driven. A house wants to be inhabited. A beer wants to be drunk. The bottle may even command a car to be taken to a place most suitable for that purpose getting emptied. A world of this type, in which objects communicate with each other, is not out of reach.

Purpose-driven, intelligent and communicating objects may resolve one of the big obstacles of a data driven economy. Once an object knows what it is made for, it is possible to operate an economy without relying on a data-rich memory system. In this model, each thing or agent would know its own use and its own degrees of freedom. One may overwrite an assigned purpose and change what a thing strives to do. But overwriting and changing its own desires would by default be a privilege of self-conscious beings.

The object-based system does not need to be completely rational and standardized, not even consistent or universal. On the contrary, in the same way humans have their changing moods and desires, objects may be as ticklish as subjects. Their behavior towards possible transactions may rather resemble dating than just being sold. They may want to enter into negotiations or complex arguments, may withdraw and reappear, may change sides and features. The system does not need to have preset rules for once and forever. Its life depends on how humans interact with things, and how objects mirror the world.

Human Agents

As much as objects, humans have an economic agency, which can be described by sets of needs or desires. A strong concept of subjectivity or identity is not needed to operate as an economic agent. One and the same person may take different roles to appear under different circumstances. In a data rich, transaction-oriented system, the agent would be declared the site of a possible equilibrium. That means that each agent should strive to give as much as it gets. Within an object-oriented economy, the personalized equilibrium can be replaced by the optimization function of the objects.

One of the crucial distinctions between objects and human agents lies in the term 'dignity'. According to Kant, dignity is what exempts the human from the realm of submission under the economic sphere. 'In the realm of ends everything has either a price or a dignity'.⁸ Unlike objects, dignity allows humans to withdraw from economic pressure, without risking their existence.

8. Immanuel Kant, *Groundworks for the Metaphysics of Morals*, trans. Allan Wood, New Haven: Yale University Press, 2002, p. 52.

Whilst objects may exist entirely within the economic sphere, humans have to be able and enabled to choose which part of their life and their activities they submit to the rules of the economic domain. That means that the descriptor of a human agent has to be up to her or his choice. There may be capabilities or needs that one does not want to be public or to be offered to the matching function. Without this clause, economic algorithms and their drive towards optimization could easily turn into an algorithmic dictatorship.⁹ Digital profiles would replace, as they already do, parts of our personality and would more or less subtly direct our wishes and needs according to manipulative matching procedures.

Humans, in contrast to objects, have to be recognized as non-efficient, often non-rational and unpredictable beings. The model of whatever algorithm should be a 'homo non-economicus', and for sure not the profit maximizing automata of current economic modeling. Freedom of decision making has to be granted not only as the freedom to choose amongst given alternatives, but on a far deeper level as the freedom to choose amongst a variety of games, or even to step out of the economic circuit as such, which would bring us back to the antique idea of freedom as being freed from the need to work at all. After all, algorithms and laws would have to be implemented according to four basic principles of human rights – dignity, public welfare, equality, and freedom. Given the poor performance of our current monetary regime, it should not be impossible to surpass the current system with its inclination to exclusive freedom for the wealthy and rising inequality.

Multidimensional Values, Ecosystem of Games

The economic field does not need to be governed by one universal algorithm alone. A diversity of needs, different products and services may be distributed according to their own set of rules. It could even be that some of these game-like instances deploy money or money-like units or whatever other mode of ranking and measurement, like karma or health.

Rhetoric and narratives around the matching algorithms may derive from contemporary computer games. In our current digital online environment, games deliver possible procedures of how to manage the exchange and matching of activities among large groups.¹⁰ Players should be allowed to transfer their characters from one game to the other. We don't want to be slaves to another game, when self-models are affected by technical protocols, and individuality or persistence of a personality turn into derivatives of online formats.

After all, behind the diversity of possible games, a basic economy needs to be put into place. For that matter, the whole ecosphere of diverse games has to participate and contribute to the basic provision for everyone. In the end, this situation may lead

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9. Antoinette Rouvroy, 'Technology, Virtuality, and Utopia: Governmentality in an Age of Autonomic Computing', in Mireille Hildebrandt and Antoinette Rouvroy (eds) *Law, Human Agency and Autonomic Computing: The Philosophy of Law meets the Philosophy of Technology*, Abingdon: Routledge, 2011, pp. 119-140.
 10. Sonia Fizek, 'Why Fun Matters. In Search of Emergent Playful Experiences', in Matthias Fuchs, Sonja Fizek, Paolo Ruffino, and Niklas Schrapp (eds) *Rethinking Gamification*, Lüneburg: Meson Press, 2014, pp. 273-287.

to a system of contribution that could replace taxation. In such a social environment, territorial boundaries would not necessarily withhold their current impact. States as entities of taxation and policing may lose their grip and be replaced by other forms of organization.¹¹ The administration of the commons could as well operate on a non-territorial basis of a meta-game.

The pluralism of possible modes of interaction shapes concepts of value. We are still accustomed to assume that each thing has to have a value that is consistent over time and equal for all persons. In a post-monetary economy this rigid concept of value becomes obsolete. It could be replaced by a radically personalized concept of valuation that takes the temporal and situative needs of economic agents as an index of value. In this case, one and the same objects could have different values for different users. The other mode of valuation would be the result of a recursive operation that integrates it with systemic needs, very much like the Google ranking does for the relevance of information. The example of Google and the way it ranks information shows the conflicts of personalized and generalized concepts of value. As much as with Google, the two concepts need to be leveled against each other in a continuous process of adjustment.

Objects don't have to be assigned one value only. Given a system in which things can be part of a multitude of different rules, they may possess different values according to which game they figure in. To give an example: an hour of electricity has a certain production cost. The price for raw material may be set in a geopolitical game that has little to do with market value. Sustainability requires a third type of valuation that counts the effects on the ecosystem at large. All these value dimensions may be kept in parallel and enter the calculation of a transaction according to the politically agreed rules.

Commons and Infrastructure

The kind of services and products that are made available to the whole population as common goods, is the result of a communal decision taken by a political body. As mentioned before, there is no need to have these institutions construed along territorial boundaries. They may well derive from games and their rule sets, which would mean that individuals also can be citizens of more than one entity.

Under post-monetary conditions, common goods and services need no longer be included into an economic system, and especially not an exploitative regime. Without state controlled money circulation, and hence without taxation, commons may be organized along liturgical practices, so that services and tasks in the common interest are being offered to the ecosphere of games against some form of retribution.

We are educated to things being scarce. This runs along common myths of current capitalism that things are in short supply and therefore have a market value. There is an intrinsic tie between money and scarcity, as money itself is a scarce good to which all other scarce goods have to be mapped. 'The innovation consists in the duplication of scarcity. The scarcity of money is placed next to the very different scarcity of goods.

11. Saskia Sassen, *Territory, Authority, Rights*. Princeton: Princeton University Press, 2006, p. 319.

That means, that *scarcity itself is codified*.¹² This relation implies that scarcity may be overcome in the moment that money as its codification is driven out of the system.

Today, most of our products are no longer scarce. Usually, we have things in such an ample supply, that scarcity has to be artificially introduced. Just to name some examples: there is no shortage in shoes. Most of the efforts of brand marketing go into codifying a shoe model with social distinctions and thereby add the distinctive quality associated with scarcity. Practices of this kind may even persist in a post-monetary world. They could be part of a particular game, in which people with accordingly distinctive needs may strive to achieve the qualifications needed to obtain the precious items.

A more critical case can be found in immaterial goods and intellectual property. Consisting in data, there is absolutely no need to limit the circulation of digital goods. Technically, each individual can contribute to the distribution of a text, a piece of music or a video by sharing it. The desperate attempt to create a legal environment that artificially curtails what is technically possible is an example of how an defunct economic value system seeks to prolong its existence and to retain its outdated set of rules. A game that calculates values along networked recursions would give higher value to what is most linked and liked. That does not imply that other participants would have to 'pay' more in order to obtain the content. As all products of intellectual labor, it would be available for free, but its producers would in some ways benefit from their success, be it by being entitled to receive more of other people's labor, or by other types of incentives depending on which game they participate in. That system turns the current regulation on intellectual property upside down. Instead of trying to shape the distribution of intellectual goods according to the economy of material production, one should rather transform the market of material goods along the distribution models of intellectual labor and file sharing.

Futures

One of the main problems with all planning economies is innovation. Algorithmic economies are very different from planned economies in this respect. Their starting point lies not in a fixed regime of planned production, but in a communication about needs and desires, only that this communication is organized differently than in a monetary economy. What facilitates the drive for creation and invention is in the end a mixture of technical progress, social relations, and personal desire. As of now, the task of mediating between desires, needs, and progress is left to the market-based institution of the private company. Profit extraction and market monopolization use personal greed as the driving force for innovation.

In a post-monetary environment, a collective expression of needs may find more human ways to get translated into production. Needs for non-existing products and services will instigate research and development. With a common drive towards the non-existing the idea of social progress, that has largely vanished from our competitive and

12. Niklas Luhmann, *Wirtschaft der Gesellschaft*, Frankfurt am Main: Suhrkamp, 1988, p. 197: 'Die Innovation besteht in der Duplikation von Knappheit. Neben die Knappheit der Güter wird eine ganz andersartige Knappheit des Geldes gesetzt. Das heißt, *Knappheit wird selbst codiert*.' [trans. from German to English by authors].

monopolized capitalist environment, could be reappropriated by the users. Their communication may feed in an informal manner into a productive environment that does not face the high barriers of market entry and subsequent monopolistic appropriation.

Without monetary constraints, games of innovation could also be less goal-driven and more experimental. As is known from a long history of media revolutions and transformations, the initially predicted purpose rarely corresponds with the final social practice that develops around a technology. Misunderstandings and inappropriate modes of use are key factors in the dissemination of communication technologies.

Consequences

In its consequences, post-monetary economies would come very close to what Keynes envisions in his essay on the 'Economic Possibilities for our Grandchildren'.¹³ With his prediction that the economical problem may be solved by a rise in welfare for everyone, he could not have been proven more wrong. Current capitalism has managed to install a system in which the accumulation of wealth even creates a situation of declining standards for the large majority of the population.

However, when it comes to production and supply, Keynes' optimism could be actually right, if it were not for the lack of distribution and equality. One of the major consequences in a post-monetary world would solve the main obstacle for a more equal society. Once left without means of storing value and bound to an algorithmic distribution of transactions, the claims of a small but rich part of the population to exert power on the workforce of the rest become unsustainable.

The impossibility of today's exaggerations in inequality will of course lead to resistance towards replacing our current well functioning system of wealth extraction. A transition may take very many different forms, other than revolutionary movements or even active resistance, which are close to impossible given the current conditions of communication and surveillance. Neither a spectacular breakdown, nor a big crisis or an increasing acceleration may lead to a change, but the slow and steady erosion of an increasingly dysfunctional monetary regime. In its niches the conditions for a different post-monetary economy are already set and growing under the shelter of and within the old structure. Retrospectively, our current world will appear as a strange, somewhat backwards, and self-destructive place. The fury with which we exhaust our resources, produce overabundance without distributing it, and insist in making workers' lives miserable, will be looked back at with amazement and awe.

13. John Maynard Keynes, 'Economic Possibilities for our Grandchildren', in *Essay in Persuasion*, New York: W.W. Norton 1963, pp. 358-373.

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PLAYABILITY AND THE SEARCH FOR AN OPEN SOURCE ECONOMY

DOUGLAS RUSHKOFF

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You can't compete with a monopoly by playing the game by the monopolist's rules.

The monopoly has the resources, the distribution channels, the R&D resources; in short, they just have too many strengths. You compete with a monopoly by changing the rules of the game into a set that favors your strengths.¹

– John R. Young, founder of SourceForge, the world's largest provider of hosting for Open Source development projects.

Approaching the market as a game allows us to challenge the inherent biases of centralized currency and monopolies as rules of a game.² The rules are not inherent to the medium; they are agreements and impositions of laws that favor the people who put them in place. The landscape itself is tilted towards certain players and away from others, and every medium of exchange contains its biases. The biases of the market economy, which are consistently upheld by scientists, technologists, and economists, are scarcity and competition. But these biases can be addressed and redefined through the playability of the medium.

From language to Facebook to the commercial market, these tools rely on a continual agreement to the social contract of the game, i.e. acceptance of the biases and adherence to the rules. However, beyond simply strategizing how to 'win' in the given rule set of the commercial marketplace, players may also attain the ability to take charge of the game and rewrite the rules themselves – thus redefining the biases.³ This means moving beyond a culture of media production to a culture of rule production, changing roles from content makers acting within the structure to programmers acting upon the structure. It is exactly these rules of the game, who has access to them, who is able to write, to edit, to hack, to play, that make all the difference.

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1. Robert Young, 'Giving it Away: How Red Hat Software Stumbled Across a New Economic Model and Helped Improve an Industry', in Chris DiBona, Sam Ockman, and Mark Stone (eds), *Open Sources: Voices from the Open Source Revolution*, Sebastopol, Ca.: O' Reilly, 1999, p. 118.
 2. Jos de Mul, 'The Game of Life: Narrative and Ludic Identity Formation in Computer Games', Joost Raessens and Jeffrey Goldstein (eds) *Handbook of Computer Game Studies*, Cambridge: MIT Press, 2005.
 3. James P. Carse, *Finite & Infinite Games: A Vision of Life in Play and Possibility*, New York: Free Press, 1986; René Glas, *Games of Stake: Control, Agency and Ownership in World of Warcraft*, PhD diss., Faculty of Humanities, University of Amsterdam, Amsterdam, 2010; Douglas Rushkoff, *Get Back in the Box*, New York: Collins, 2005.

Play is characterized by both freedom and constraints. Players are first aware of their freedom to choose whether or not to play.⁴ Players are also aware of the guiding rules of play, including boundaries such as physical demarcations, time constraints, and behavioral procedures.⁵ From this, we can define 'playability' as a metric for how much play a medium or game allows, as well as a person's or society's capacity for interactivity and agency. Playability is comprehension of the rules of a game and freedom to participate or opt out. Assessing the playability of a medium such as the market economy allows for a new measure of access to the medium itself.

In terms of playability, the net offers people the opportunity to build economies based on different rules – commerce that exists outside the economic map that is mistaken for the territory of human interaction. Entrepreneurs can start and even scale companies with little or no money, making the banks and investment capital on which business once depended obsolete. (I have argued in talks and papers that this was the real reason for the so-called economic crisis: there is less of a market for the debt on which the top-heavy game is based.)⁶ People can develop local and complementary currencies,⁷ barter networks,⁸ and other exchange systems independently of a central bank, and carry out secure transactions with smart phones using add-ons and applications.

There were once other kinds of money with very different slopes to them. In fact, throughout history, we find some of the most highly prosperous peoples using more than one currency at a time. It's only when they are conquered by a centralized regime, usually from a great distance, that their regional currency systems are outlawed in favor of a single coin of the realm. Then, prosperity drains from the newly conquered territory to the center, in a monolithic fiscal scheme more like the one in use today.

From about the 10th through the 13th century – the Age of Cathedrals, as it was once called – most of Europe enjoyed two main kinds of currency: centralized money, used for long distance transactions, and local currency for daily transactions.⁹ Local currency worked very differently from centralized currency. Instead of being issued by a central bank, it was quite literally worked into existence, accurately reflecting the bounty produced. And because of the peculiar bias of this money, the people who used it were among the most prosperous working classes ever.¹⁰

During this time period, a farmer would reap his harvest and bring it to a grain store. The grain-store operator would then hand the farmer a receipt, indicating the amount of grain, wine, or other commodity he was storing on the farmer's behalf. This receipt then served as money. In ancient Egypt, where this practice was first introduced, the

4. Johan Huizinga, *Homo Ludens: A Study of the Play-Element in Culture*, Boston: Beacon Press, 1971, p. 7.

5. Carse, *Finite & Infinite Games*, 1986, p. 9.

6. See Rushkoff, 2009.

7. Carse, *Finite & Infinite Games*, 1986.

8. See <http://www.itex.com>.

9. Bernard Lietaer, *The Mystery of Money: Beyond Greed and Scarcity*, Munich: Riemann Verlag, 2000, p. 183.

10. Bernard Lietaer and Stephen M. Belgin, *Of Human Wealth: Beyond Greed & Scarcity*, Boulder, CO: Human Wealth Books and Talks, 2004, p. 104.

receipt was a shard of pottery – an ostrakon – that could be broken into pieces as the farmer ‘spent’ the grain stored in his name.¹¹ In the Middle Ages, the money was mostly made of precious metal banged into thin foil coins – *brakteaten* – which could be torn into smaller segments.¹² This local coinage was not saved for long periods, because it didn’t earn any interest. In fact, the longer it was kept, the less it was worth.

We can reframe this analysis in the language of media ecology,¹³ that is, by studying these transactions as carriers of meaning, with impact and influence on a larger, more complex and shifting media environment. By doing so, we see why the bias of local currency was not toward saving but toward spending. Hoarding money meant losing value, so everyone sought to get rid of his money before the next recoinage. Capital meant nothing if it wasn’t actively invested. People put their money to work maintaining their equipment, building windmills, improving their wine presses, and so on. The fact that the currency cost money encouraged people to think of other ways to create value over time. In the Age of Cathedrals, even small towns invested in tremendous architectural projects to generate tourism spending by pilgrims. Cathedrals were not funded by the Vatican Bank, they were local, bottom-up investments made by farmers and other laborers on behalf of future generations.¹⁴

Like their Middle Ages forebears, the founders of the open source movement were looking primarily to set standards through which a community could invest in its own future. At its most fundamental, open source simply requires that the code on which software runs be freely available to anyone. This transparency invites innovation and growth by allowing anyone to build upon existing software programs. ‘Open Source began as an attempt to preserve a culture of sharing and only later led to an expanded awareness of the value of that sharing.’¹⁵ Open source did not invent these behaviors but it seeks to maintain them in a way that benefits the individuals involved in creating value, those benefiting off their creations, and the greater good yet to be defined.

The open source model was developed at the close of the 20th century by computer software engineers, motivated by genuine fears that innovation would be hindered as increasing commercial capital was invested into the development of their science.¹⁶ The creativity that was necessary to drive growth in their fairly young field of inquiry could be definitively and swiftly cut short if it had to take place within the closed, competitive climate of proprietary commercial software development. Instead of seeking standards, sharing innovations, and building on each other’s successes, engineers in a proprietary scheme would be required to keep secrets, to re-invent one another’s advancements, and be denied the benefit of working together on the same problems.

11. Lietaer, *The Mystery of Money*, 2000, p. 88.

12. Frank Berger, *Die Mittelalterlichen Brakteaten im Kestner-Museum, Hannover 2*, Hannover: Teil, 1996, p. 9.

13. Neil Postman and Charles Weingartner, *Teaching As a Subversive Activity*, New York: Delacorte Press, 1969.

14. Lietaer, *The Mystery of Money*, p. 145.

15. Tim O’Reilly, ‘The Open Source Paradigm Shift’, in Chris DiBona, Danese Cooper, and Mark Stone (eds), *Open Sources 2.0*, Sebastopol, CA: O’Reilly, 2006, p. 255.

16. For the history of Open Source, told by an assortment of its early participants, see DiBona, Ockman and Stone (eds), *Open Sources: Voices from the Open Source Revolution*, 1999.

For the programmers, open source served as a code of business ethics. While individual people and companies could still package and sell the fruits of open source labor, the underlying code was a shared resource that anyone could utilize. So while the Linux operating system might be free to anyone, an individual developer could create a particularly simple installation disk for it, and charge whatever he pleased. The Linux operating system itself was developed in a culture that combined collaboration with independent, autonomous development.¹⁷ Many technologists and businesspeople alike were awed by the technologies and the profits this seemingly new model of collaboration engendered – from Linux to Mozilla and Redhat to Firefox. It was not long before open source was acknowledged as ‘the natural language of a networked community’¹⁸ which ‘nobody owns, everybody can use and anybody can improve.’¹⁹

The success of open source as a programming methodology became the inspiration for its application across a wide number of fields. How many other cultural institutions might benefit from engaging their communities in collective, shared production? My own books, from *Open Source Democracy* to *Nothing Sacred: The Case for Open Source Religion*, looked at the application of the open source ethos to government and religion, which I believed to be suffering from insider cultures and lack of access. Even pro-corporate *Wired* magazine ran pieces such as ‘Open Source Everywhere’²⁰ and ‘Collaborative Culture’, suggesting that the proprietary way of doing things may have run its course.²¹

However, open source ideology is most practically aligned with economic theory. Open source means more people creating and contributing value and ultimately invested in the resulting outcome. It creates new markets by competing against under-consumption and non-consumption. And as seen in the case of Netscape/Firefox vs. Microsoft Explorer, open source can be used to break up monopolies while still allowing individuals to participate in a system of value exchange. It reflects a business more concerned with sustainability in the long term, treating its users as equivalent stakeholders, as investors, rather than prioritizing short term or exponential growth. As Eric Raymond eloquently argued, open source is the ethos of the bottom-up bazaar.²²

For now, however, we must acknowledge the fact that what playability the net might offer in this regard is not generally embraced or acknowledged. Yes, bloggers and You-Tubers have had many successes, particularly against government. They have brought down a Republican senator, an attorney general, and even made headway against the repressive net censorship of the Chinese. WikiLeaks has released thousands of documents much to the consternation of the U.S. government, and the people of Egypt and Syria have utilized technologies as corporate-driven as Facebook to organize re-

17. As well as a central, overseeing arbiter meant to stand in for the user and judge the contributions of the many.

18. O'Reilly, ‘Open Source’ 2006, p. 260.

19. Doc Searls and David Weinberger, ‘World of Ends What the Internet Is and How to Stop Mistaking It for Something Else’, 10 March 2003, <http://worldofends.com>.

20. Thomas Goetz, ‘Open Source Everywhere’, *Wired*, November 2003, <http://www.wired.com/wired/archive/11.11/opensource.html>.

21. D. Wolk, ‘Future of Open Source: Collaborative Culture’, *Wired* (June 2009), http://www.wired.com/dualperspectives/article/news/2009/06/dp_opensource_wired0616.

22. Eric S. Raymond, *Cathedral and Bazaar*, Cambridge, MA: O’Reilly, 2001.

sistance to repressive regimes. YouTube not only embarrassed then-candidate Barack Obama about his minister's race-toned rants; it also exposed political repression in Myanmar and FEMA incompetence in New Orleans.

But this activity is occurring on a platform that has almost nothing to do with the commons. The internet may have been first developed with public dollars, but it is now a private utility. We create content using expensive consumer technologies and then upload it to corporate-owned servers using corporate-owned conduits, usually for a fee. More significantly, we are doing all this with software made by corporations whose interests are embedded in its very code. Maybe this is why governments, and rarely corporations, are the ultimate targets of most internet activism.

While examples exist, most resistance to corporatism still occurs on the bigger stage, created and dominated by the corporate players, themselves. The unique potential of interactive technologies to undermine the dominance of the single, 'closed source' reality of the corporate-sponsored spectacle is left untapped. Instead, the media environment informing resistance and would-be extra-corporate activity is that of television and other closed source, top-down media. Speaking 'truth to power' seems more important than sharing truth with one another.

Meanwhile, the decentralizing effect of new media promised by the likes of Tim O'Reilly and John Batelle in prominent essays such as 'Web Squared'²³ has been met by an overwhelming concentration of corporate conglomeration. New web companies are purchased by giants like Google, Facebook, and Microsoft as much for the programmers working within them as for whatever decentralized technologies they might be developing.²⁴ As a result, whatever visions or agendas these programmers may have had for starting their companies in the first place are subsumed by the conglomerates who acquire them, and their programming abilities are applied to wholly different projects.²⁵

As a result, when a potentially destabilizing and decentralizing technology or principle such as shareware, viral media, or open source emerges, this half-true and half-hearted style of inquiry follows the story only until a means to arrest its development is discovered and new strategies may be offered. Like a radical garage band discovered by a record label, anything radical is neutralized before the CD gets to the mall.²⁶

The open source ethos, through which anyone who understands the code can effectively redesign a program to his own liking, is repackaged by culture guru Jeff Howe as 'crowdsourcing'²⁷ through which corporations can once again harness the tremendous potential of real people acting in concert, for free. My own concept of 'viral media'²⁸ is reinvented by Malcolm Gladwell as 'social contagion', or Tim Draper as 'viral market-

23. Tim O'Reilly and John Battelle, 'Web Squared: Web 2.0 Five Years On', *Web 2.0 Summit*, 10 October 2009, <http://www.web2summit.com/web2009/public/schedule/detail/10194>.

24. Matt Rosoff, 'Google's 15 Biggest Acquisitions and What Happened to Them', *Business Insider*, 14 March 2011, <http://www.businessinsider.com/googles-15-biggest-acquisitions-and-what-happened-to-them-2011-3?op=1&IR=T>.

25. As just one example, the purchase of Dodgeball by Google in 2005.

26. Thomas Frank, *The Conquest of Cool*, Chicago: University of Chicago Press, 1997.

27. Jeff Howe, 'The Rise of Crowd Sourcing', *Wired*, June 2006.

28. Douglas Rushkoff, *Media Virus*. New York: Ballantine Books, 1994.

ing' – techniques through which mass marketers can once again define human choice as a series of consumer decisions. My other main contribution to culture studies, the notion of 'social currency through which people develop non-monetary value',²⁹ is now the name for an American Express Card rewards program: 'The Social Currency'. The decentralizing bias of new media is thus accepted and interpolated only until the market's intellectual guard or hired marketers can devise a new countermeasure for their patrons to employ on behalf of preserving business as usual.

Indeed, the internet might pose a threat to both centralized media and centralized value creation. But the dominance of the corporatist system, the triumph of the corporatist spectacle, as well as the legacy of a central currency operating system, has limited the thinking of most net theorists and economists. In short, without a media ecological framework, these practitioners remain woefully unaware of the contexts defining their activity.

The self-styled revolutionary 'net economics' of these internet authors are in fact reactionary responses well within the boundaries defined by their corporate patrons. Instead of imagining genuinely participatory or peer-to-peer possibilities, they simply offer new ways for companies and individuals to participate in the status quo corporatist economy.

The muting of the net's greater potential for playability reduces it from a peer-to-peer medium back to something more like a broadcast medium, at least insofar as its potential to shift the relationship of people to the corporations with and through which they transact and make meaning. True playability involves access to the playing field itself, and even the ability to rewrite those rules or transcend the game altogether.

The crucial capacity of the internet to introduce increased playability to the corporatist system will depend on the public's willingness to embrace the new demands of the internet environment. On the internet, this means learning the languages through which rules of interaction are written, protocols are established, and technologies are either opened or closed to participation. By extension, this applies as well to the cultural software and operating systems defining our participation in the public sphere and marketplace alike. The public must not only achieve a base level of computer and media literacy, but we must also become aware of the way that media and technology create environments, and how we can participate in this process – or at least become more conscious of the media ecology in which we are functioning as a first step toward an alternative to corporatism.

29. Rushkoff, *Get Back in the Box*, 2005, p. 78.

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ACCUMULATION AND RESISTANCE IN THE 21ST CENTURY

ANDREW ROSS

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Thanks to Thomas Piketty and Emmanuel Saez, a lot of attention has been focused recently on wealth accumulation at the top. The income data they have gathered shows that the primary source of accumulation for the 1 percent now comes in the form of economic rents (from debt-leveraging, capital gains, manipulation of paper claims through derivatives, and other forms of financial engineering).¹ The corresponding accumulation of household debt (you can't have one without the other) has been neglected, however, despite evidence that it continues to increase, posing a threat to the capacity of democracies to protect their citizenry from economic harms imposed by the creditor class.²

For a while, there seemed to be some good news on this front. Overall household debt was on the decrease from its sky-high levels just before the financial crash. In the U.S., debt service, which reached more than 14 percent of after-tax income by the end of 2007, had fallen to 10.5 percent by April 2013.³ Much of the deleveraging was due to low interest rates, and to a reduction in mortgage debt, though it is not clear how much of the decrease came from banks writing off delinquent loans rather than from faithful repayment. In the third quarter of 2013, this decline ended, and mortgage debt started to rise again, by \$56 billion. The fourth quarter showed a 1.9 percent leap in mortgages and 3.9 percent in non-housing household debt. Auto loans and credit card balances also started to move upward, and the trend continued through the first quarter of 2014, with an advance of 1.1 percent, taking overall U.S. household debt to \$11.65 trillion. Similar figures were recorded for most of the industrialized economies, though none could compare with the U.S.'s outlier figures on the student debt burden, which has not abated at all in the six years since 2008, and is now approaching 1.3 trillion, with default rates averaging a million a year.

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1. Thomas Piketty, *Capital in the Twenty-First Century*, Cambridge: Harvard University Press, 2014; 'Striking it Richer: The Evolution of Top Incomes in the United States', a series of data reports by Emmanuel Saez and Thomas Piketty, outlines how the 1 percent have captured income growth. The first in the series was 'Income Inequality in the United States, 1913-1998', *Quarterly Journal of Economics*, 118.1 (2003): 1-39. The most recent update can be found at <http://elsa.berkeley.edu/~saez/saez-UStopincomes-2012.pdf> showing that the top 1 percent earners captured 95 percent of the income gains since the recession officially ended. Also see Josh Bivens and Lawrence Mishel, 'The Pay of Corporate Executives and Financial Professionals as Evidence of Rents in Top 1 Percent Incomes', *Journal of Economic Perspectives* (Summer 2013), and Edward N. Wolff, 'The Asset Price Meltdown and the Wealth of the Middle Class', New York University, 2012 accessible at <https://appam.confex.com/appam/2012/webprogram/Paper2134.html>.
 2. Many of the arguments, and a good deal of the content, for this article are drawn from Andrew Ross, *Creditocracy and the Case for Debt Refusal*, OR Books, 2014. Available at <http://www.orbooks.com/catalog/creditocracy/>.
 3. Jeff Madrick, 'A Bit of Good News', *Harper's*, April 2013: 6-7.

If these numbers continue to rise, as it seems likely, then it's clear that the bottom of the debt deflation trend turned out to be not very deep. Once people are persuaded it is safe to start borrowing again, then interest rates will be hiked – an invitation for the banks to stop hoarding their cash reserves and embark on a new season of predatory lending. This invitation to the banks is backed by the proven willingness of governments to bail them out even in the face of high rates of personal default and mass immiseration among the citizenry. Such assurances that the banks will always be made whole are critical to any creditor's calculation that higher levels of debt service are sustainable. The gap between the deflated bottom and projected, or aspirational, levels of rent extraction is now large enough for them to jump back into the lending game, an outcome that no amount of quantitative easing has been able to bring about.

Equally serviceable is the gathering consensus among economists – even those critical of neoliberalism – that the so-called 'debt overhang' from the 2008 crash has largely been resolved and that it is not only safe to begin borrowing again but also it is necessary if GDP-driven growth is to get back to business as usual. This is not particularly good analysis nor is it good advice. A debt overhang is one of these dodgy concepts economists use to rationalize an otherwise unsustainable or high-risk condition. And as for GDP-driven growth, all the evidence shows that any such economic program is a recipe for ecological collapse.

Rise of Creditocracy

Today we live in the kind of society – I call it a creditocracy – where pretty much everybody is up to their neck in debt that can never be repaid, nor is supposed to be.

The gut liberal response is to say, 'That's not fair, no one should have debts that can never be repaid, and besides, why would banks want that?' This is to miss the point entirely. It's important to understand that our creditors don't want us to pay off our debts entirely – for the same reason that credit card issuers don't want us to pay off our credit card balance every month. Customers who do this diligently are known in the industry as 'deadbeats', because they appear to get credit for free. The ideal citizens in a creditocracy are the revolvers who cannot make ends meet, and who pay the minimum along with merchant fees and penalties every month, rolling over their credit from month to month.

Creditors' profits come from extending our debt service as long as they possibly can. After all, if we pay down our debts, we are no longer serviceable to the banks. The goal is to keep us on the hook until we die, and even beyond the grave in the case of student debts that are co-signed by parents or grandparents. Not surprisingly, there has been a marked generational shift in the debt burden toward the elderly. In the postwar model of life-cycle lending, it was more or less assumed that middle-class borrowers would earn the right, in their senior years, to live debt-free, and it was a source of pride among the elderly, especially debt-aborrent Depression babies, to have never paid a finance fee. That is no longer the case, and not just because debt-tolerant boomers have entered the ranks of the retired. Patterns of capitalist profit have shifted, and are more tied to lifelong financial extraction.

The major banks are bigger and more profitable than before the 2008 crash. The exposure of American banks to derivatives alone has increased to \$232 trillion, almost

a third more than before 2008 when the escalation of these risky bets helped to bring on the financial crash. The big six U.S. banks collectively are carrying a debt load of \$8.7 trillion. With that combination of debt overhead, exposure to dodgy derivatives, leverage over the national economy, and continued weak regulatory oversight, there is a very high risk of a repeat of the 2008 meltdown. Indeed, many industry insiders believe that an equally ruinous relapse is already in the making. Legislators are all but powerless to bring the banks to heel. U.S. Attorney General Eric Holder himself acknowledged publicly last year in testimony to the Senate Judiciary Committee that when banks acquire so much concentrated power, it is 'difficult for us to prosecute them... if you do bring a criminal charge, it will have a negative impact on the national economy, perhaps even the world economy'.⁴

Holder's admission that the government lacked the wherewithal to punish bankers for their widely-publicized record of extortion was a significant milestone, particularly for a democracy that has long struggled to contain the damage inflicted by plutocrats in its midst. But the ability of Wall Street barons to hold the government in thrall is nothing new.⁵ In a 1933 letter, Franklin D. Roosevelt wrote: 'The real truth of the matter is, as you and I know, that a financial element in the large centers has owned the government ever since the days of Andrew Jackson.'⁶ Owning lawmakers may be a venerable prerogative for American financiers, but the rise of a full-blown creditocracy is more recent. Financialization had to creep into every corner of the household economy before the authority of the creditor class took on a sovereign, unassailable character.

In other words, it is not enough for every social good to be turned into a transactional commodity, as is the case in a rampant market civilization. A creditocracy emerges when the cost of access to each of these goods, no matter how staple, has to be debt-financed, and when indebtedness becomes the precondition not just for material improvements in the quality of life, but for the basic requirements of life. Financiers seek to wrap debt around every possible asset and income stream, placing a tollbooth on every revenue source, ensuring a flow of interest from each. Furthermore, when fresh sources of credit are routinely needed to service existing debt (neatly captured in the 1990s bumper sticker, 'I Use MasterCard to Pay Visa'),⁷ we can be sure we are entering a more advanced phase of creditor rule.

This kind of arrangement – borrowing to cover existing debt service – was formally institutionalized in the so-called debt trap of the 1970s and 1980s, which put paid to the developmental aspirations of so many global South countries. IMF loan installments were offered, not to support social or economic development, but specifically to ensure Northern creditors would continue to see debt service on their older loans. When the debt trap migrated to the North, the same formula got a good airing during

4. See <http://dealbook.nytimes.com/2013/03/11/big-banks-go-wrong-but-pay-a-little-price/>

5. See Nomi Prins, *All the Presidents' Bankers: The Hidden Alliances that Drive American Power*, New York: Avalon, 2013.

6. Letter to Col. Edward Mandell House (21 November 1933), in Elliott Roosevelt (ed.) *F.D.R.: His Personal Letters, 1928-1945*, New York: Duell, Sloan and Pearce, 1950, p. 373.

7. As quoted in Robert Manning, *Credit Card Nation: The Consequences of America's Addiction to Credit Cards*, New York: Basic Books, 2000, p. 27.

the Eurozone crisis, especially in Greece, where the 'rescue package' offered by the troika was expressly aimed at making German, French, and Swiss bankers whole.

But for the working poor, this kind of permanent indebtedness is a very familiar arrangement, and has long outlived its classic expression under feudalism, indenture, and slavery. Each of these systems of debt bondage gave birth to successor institutions – sharecropping, company scrip, loan sharking – and their legacy is alive and well today on the subprime landscape of fringe finance, where 'poverty banks' operate in every other storefront on Loan Alley. But the bonds generated by household debt have also spread upwards in recent decades, and now affect the majority of the population, tethering two generations of the college-educated. In the U.S., 77 percent of households are in serious debt, and one in seven Americans is being, or has been, pursued by a debt collector.⁸

Even those without personal loans are debtors, because public debts, especially municipal obligations, have been structured in such a way that the service costs to Wall Street are now routinely passed on to all of us in the form of austerity policies. And what about the beneficiaries? The tipping point for a creditocracy occurs when 'economic rents' are no longer merely a supplementary source of income for the creditor class, but have become the most reliable and effective instrument for the amassing of wealth and influence. In that respect, a full-blown creditocracy may be considered distinct from earlier forms of monopoly capitalism in which profits from production dominated.

There are many ways of illustrating this historic development. Consider the balance of power between banks and government. In 1895, J.P. Morgan was called upon to save the U.S. Treasury from default (and again in 1907), and yet the shoe was on the other foot by 2008, when the Treasury was forced to bail out JPMorgan Chase, and few doubt that it would be obliged to do so again today. The shift is also displayed in how corporations make profits. Jumbo firms, like General Electrics and General Motors, that commanded the economy on the strength of their industrial production have become much more dependent, for their revenue, on their firms' respective finance arms. Companies are no longer regarded primarily as worthy recipients of productive loans for tangible outputs but as targets for leveraged buy-outs, to be loaded down with debt and ruthlessly used to extract finance fees and interest. The difference between Mitt Romney's career, at Bain Capital, and his father's, at the American Motor Company, neatly summarizes the transition from industrial to financial capitalism.⁹ As for ordinary individuals, we are now under constant financial surveillance by the major credit bureaus (Equifax, Experian, and TransUnion), whose credit reports, scores, and ratings of our conduct as debtors control the gateways to so many areas of economic need and want. Operating outside of public oversight, these agencies answer only to

8. According to an August 2013 report from the Federal Reserve Bank of New York, almost 15 percent of all credit reports – covering an estimated 30 million consumers – displayed collection items from debt collection. In other words, one in seven Americans was being, or had been, hounded by debt collectors. *Quarterly Report on Household Debt and Credit* (August 2013) accessible at http://www.newyorkfed.org/research/national_economy/householdcredit/DistrictReport_Q22013.pdf.

9. Matt Taibbi, 'Greed and Debt: The True Story of Mitt Romney and Bain Capital', *Rolling Stone*, 29 August 2012.

the requirements of the creditor class, and the profiles they assign to us are like ID tags, marking our rank and class, in the present and in the years to come, since they are used to predict future behavior.

We know that more and more of the 99 percent are suffering from undue debt burdens – financial claims that can never be repaid – but is it so clear who belongs to the class of creditors? Following Margaret Thatcher's promotion of 'pension fund capitalism', the pension funds of workers have been drawn into the financial markets. Indeed, these funds now hold a significant portion of the public debt, especially municipal debt, currently being used as a justification for pushing through austerity policies. In a formal and legal sense, the workers are creditors, and they stand to lose if the debts are written off indiscriminately in a bankruptcy proceeding. In accord with the 'popular capitalist' mentality encouraged by Thatcher and her neoliberal successors, their investments, like all others, are exposed to risk. Indeed, pension funds managers are forced to make speculative investments to meet their long term promises (as much as 8 percent in annual returns) to contributors, and so they entrust the money to Wall Street hucksters looking to charge high fees and offload high-risk derivatives. Corporate pension funds are routinely looted by corporate raiders, and state pension funds have become an especially ripe target for employers or governments looking to borrow cash, or turn them over to hedge funds and private equity funds.

But investing savings for retirement has little bearing on workers' primary identity as waged labor, though contradictions clearly arise when the investments are handled by Wall Street funds that inflict damage on workers' interests in general. Even if the annuities do turn out as promised, decades hence, the recipients have not been generating their main income from investment, as is the case for the principal beneficiaries of a creditocracy. Workers who are part of the 'real' economy, and whose household debts have risen while their wages stagnated, do not really inhabit the same world as the players who live off unearned income in the undertaxed world of financial engineering. For sure, the diversification of pension funds, and the growth of 401(k) retirement plans, means that many more of us who do productive work are tied into the world of finance than was once the case. But this circumstance has not substantially altered our sense of being in the world, and it is far outweighed by our ensnarement, like everyone else we know, in the bankers' debt trap.

Banks, hedge funds, private equity firms and other entities that operate in the shadow banking system have an interest in gathering influence and immunity for themselves, but they are first and foremost tools of accumulation for their owners, clients, shareholders, and direct beneficiaries. As such, their business is to grab as much as the economic surplus as they can by keeping everyone else in debt, for as long as possible. The fact is that debts, especially at compound interest, multiply at a much faster rate than the ability to repay. Original lenders know this fact, which is why they sell on the loans as fast they can.

Democracy and Debt

Managing the lifelong burden of debt service is now an existential condition for the majority, but what about its impact on citizenship? How can a democracy survive when it is on the road to debt serfdom? The history of the struggle for political liberty is closely tied to the growth of credit. As James MacDonald has argued, the democratic institu-

tions of liberal societies were able to survive and flourish because government bonds made it possible to borrow cheaply, especially in times of war.¹⁰ But today's bond markets, which are globally networked and susceptible to speculative bets from hedge funds, are more likely to 'judge', 'discipline', and 'reward' policymakers than to faithfully serve their ends. Central banks increasingly act to ensure the solvency of banks, and not sovereign governments struggling with public deficits. The right of creditors to be made whole now routinely overrides the responsibility of elected national representatives to carry out the popular will, resulting in 'failed democracies' all over the world. Everywhere we look, officials are being pressured to use governments as collection agents for foreign bondholders or pass on the costs of bankers' speculative investments to the most vulnerable populations. This is not just an economic arrangement, it is also a relationship of power, with devastating impact upon popular sovereignty. Even Mario Monti, the placid technocrat appointed in 2012 as Italian prime minister in order to dampen popular opposition to financial power, spoke out against what he called the emergence of 'creditocracy' in Europe. He was referring specifically to how sovereign governance was being circumvented by the priority given to foreign bondholders, as represented through the big German, French, Swiss, and Dutch banks.

The historical record shows that a society unable to check the power of the creditor class will quickly see the onset of debt bondage; democracies segue into oligarchies, credit becomes a blunt instrument for absorbing more and more economic surplus, and rents are extracted from non-productive assets. Are we heading down this path, once again? Or is it just loose talk? Many commentators are saying as much when they point to the revival of debtors' prisons, speak of student debt as a form of indenture, and compare banking practices, on Wall Street as well as on Loan Alley, to the most extreme forms of usury. So, too, the revival of interest in a debt jubilee, not only in developing countries, but here in the global North, is evocative of macro-solutions hatched in the ancient world by rulers who were so desperate to restore the balance of popular power in their favor that they abolished all existing debts, freed debt slaves, and returned land to original owners.

This kind of talk is indicative of the extremity of the current debt crisis. All the evidence shows that drastic relief measures are needed, and that a new kind of non-extractive economy, benefitting from what Keynes called the 'euthanasia of the rentier', ought to be built. Pursuing that alternative path – to a society guided by the productive use of credit – may be the only way of salvaging democracy. But for establishment economists, even those who question the credo of neoliberalism, there is no crisis, only a debt 'overhang' that needs to be reduced to manageable levels before the normal pattern of debt-financed growth can reassert itself.

There is no easy return to that debt-growth formula. After incomes stagnated in the 1970s, respectable growth rates could only be achieved through a series of speculative asset bubbles. Each time the bubble burst, we could see how the formula rested on an insubstantial foundation. As far as lasting prosperity goes, we can say that much of the growth was fake, producing only phony wealth, and that future efforts to inflate

10. James MacDonald, *A Free Nation Deep in Debt: The Financial Roots of Democracy*, New York: Farrar, Strauss & Giroux, 2003.

prices will end the same way. Also from an ecological perspective, this pattern is entirely unsustainable. There now exists a mountain of scientific evidence, beginning with the seminal 1974 report, *Limits to Growth*, which testifies to the calamitous impact of GDP-driven growth on the biosphere. Restoring business as usual, once that pesky 'overhang' disappears, can only be a recipe for eco-collapse.

As with any unjust social arrangement, a creditocracy has to be stripped of its legitimacy in the public mind before its actual hold on power is dissolved. How far along this road have we come? Given the battering that bankers have taken over the past five years, it's a testament to their self-projected mystique that they still command even a fraction of their standing as indispensable members of society. Every other day brings a fresh headline about their misconduct and profiteering, as swindle after swindle is uncovered. The judicial investigations multiply, producing few convictions (and only of junior employees) but an ever-longer roster of fines, refunds, and other penalties. Some of the settlements to end the criminal and civil charges are massive. JPMorgan Chase, for example, negotiated a \$13 billion settlement the U.S. Justice Department over packing mortgage-backed securities with dodgy home loans. Notably, less than \$3 billion was claimed in fines and only \$4 billion in relief for homeowners, while more than \$6 billion was allocated for investors who suffered losses.¹¹ Bank of America settled for \$17 billion under similar terms. But the profits of these banks and their peers are so large that such penalties are shrugged off as the cost of doing business. Public trust, the crucial quality that banks have customarily relied on in order to trade, has long been decimated; we have come to regard their ingenious financial products as little more than scams, and we know that the bill for all of their risky conduct will likely end up with us. Yet the banks retain their cachet as essential institutions, and most importantly, their lobbying firepower ensures that legislators will look out for their interests.

In *The Bankers' New Clothes*, Anat Admati and Martin Hellwig argue that 'there is a pervasive myth that banks and banking are special and different from all other companies in the economy. Anyone who questions the mystique and the claims that are made is at risk of being declared incompetent to participate in the discussion.'¹² Finance, we are encouraged to believe, is too complex for lay people to understand. One of the outcomes of this mystique is that too many of us are trapped in the payback mindset. Though we may be more and more aware of the irresponsibility and fraud of big creditors who won't pay their own debts, and who offload all their risky loans to others, we still accept that it is immoral to fail to repay our debts to them. Of course, there are lawyers, courts, and police standing at the ready to enforce this payback morality, and a ruined credit score to live with in the case of a default. But these are instruments of coercion; they serve as backups if the mechanism of consent falters. When the psychology of the debtor shifts, as it is now slowly doing, from resignation to reluctance, or even resistance, then the authority of the creditors' self-interested moralism begins to lose its sway. Then, and only then, are we able to honestly question whether we owe anything at all to people and institutions that, were it not for the figment of the banker's new clothes, would rightly be seen as engaged in extortion.

11. Peter Eavis and Ben Protess, 'Considering the Fairness of JPMorgan's Deal', *The New York Times*, 22 October 2013.

12. Anat Admati and Martin Hellwig, *The Bankers' New Clothes: What's Wrong with Banking and What to Do About It*, Princeton: Princeton University Press, 2013, p. 2.

Abolishing the Debt Sentence

More public education is needed about how creditor rule is upheld, and it is in that spirit that we must make the case for the refusal of household debts. When a government cannot protect its people from the harms inflicted by rent extractors, and when debt burdens become an existential threat to a free citizenry, then the refusal to pay is a defensible act of civil disobedience. For those aiming to reinvent democracy, this refusal is nothing short of a responsibility. The case for debt cancellation in developing countries has already been made by groups within or allied to the Debt Jubilee movement.¹³ These advocates have devised moral and legal arguments for repudiating the external debts of governments, and have had some success in delivering relief for some of the world's poorest populations. Public debts in the Global North are now at the core of the austerity policies being implemented from the battered periphery of the Eurozone to the beleaguered cohort of ex-industrial cities like Detroit and Baltimore. The process of questioning which of these debts is legitimate – and deserving of repayment – and which are unfair impositions to be rightfully rejected, is already underway.¹⁴ Now is the time to extend this initiative to household debts, especially those taken on simply to gain access to basic social goods.

In what follows, I summarize some of the arguments underpinning the case for debt refusal. Most appeal to broad moral principles, as opposed to quantifiable rules, but there is no reason why these principles could not be applied in a way that would produce some hard numbers:

- Loans which either benefit the creditor only, or inflict social and environmental damage on individuals, families, and communities, should be renegotiated to compensate for harms.
- The sale of loans to borrowers who cannot repay is unprincipled, and so the collection of these debts should not be honored.
- The banks, and their beneficiaries, awash in profit, have done very well; they have been paid enough already, and do not need to be additionally reimbursed.
- Even if household debts were not intentionally imposed as political constraints, they unavoidably stifle our capacity to think freely, act conscientiously, and fulfill our democratic responsibilities.
- Extracting usurious, long-term profits from our short-term need to access subsistence resources is immoral, and no less so in the case of vital common goods like education, healthcare, and public infrastructure.
- Each act of debt service is a non-productive addition to the banks' balance sheets, and a subtraction from the 'real' economy which creates jobs, adequately funds social spending, and sustains the well-being of communities.
- The credit was not theirs to begin with; it was obtained through the dubious power of money creation, thanks to fractional reserve banking and to the 'magic' of derivatives. Obliging debtors to forfeit future income is a form of wage theft, if the debts were incurred simply to prepare ourselves, in mind and body, for employment.

13. Damien Millet and Eric Toussaint, *Who Owes Who? 50 Questions about World Debt*, London: Zed Books, 2004; *Debt, the IMF, and the World Bank: Sixty Questions, Sixty Answers* New York: Monthly Review Press, 2010.

14. François Chesnais, *Les Dettes Illégitimes: Quand les Banques Font Main Basse sur les Politiques Publiques*, Paris: Liber, 2012.

- Given the fraud and deceit practiced by bankers, and the likelihood that they will not refrain from such anti-social conduct, it would be morally hazardous of us to reward them any further.

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MEASURING VALUE IN THE COMMONS-BASED ECOSYSTEM: BRIDGING THE GAP BETWEEN THE COMMONS AND THE MARKET

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Prelude

Maya is a bubbly girl who is well known for community activities in her small town. She has two clear passions: writing Wikipedia articles and making Creative Commons documentaries... yet she struggles to make ends meet, and resorts to stressful and unfulfilling advertising work in order to make some money.

Maya is one among many who contribute daily to projects like Wikipedia, Creative Commons and Open Source software. But how much value does each of these projects have? How do people value these contributions? How could contributors be rewarded for their hard work while still retaining the voluntary and cooperative dynamics inherent to these projects? Ideally, we would like to figure out:

- A way for these kinds of projects to assess their own social value.
- A way for people to understand the value they are contributing to these projects.
- A way for people to benefit from the goods and services provided by the market, without necessarily having to play by the rules of the market.

Maya would love to have a way for her and others to see how much she is contributing to the social good. Maya's family doesn't understand why she spends so much time working on things that offer no money in return, while Maya is frustrated that her contributions to the commons are not recognized as actual work by society. Moreover, Maya would love her contributions to society to be recognized, and potentially rewarded, by the market, so that she would not have to spend so much time on her advertising job.

How could we help Maya?

We present here a system – which for the sake of this example, we will name Sabir – that can resolve some of the most recurrent problems encountered in Commons-based Peer Production (CBPP) communities. The Sabir system¹ is composed of three layers that will help us:

1. Sabir website: <http://sabir.cc>. For additional details on the implementation, see the FAQ on the website.

1. Understanding the social value – as opposed to the market value – of different CBPP communities, in order to make an informed comparison.
2. Identifying the value generated by individuals contributing to the commons and evaluating it through a common denominator.
3. Creating an interface between the market and the CBPP ecosystem so that the two can interact, and benefit from each other.

Introduction

Today, the production and dissemination of information is increasingly done outside of the market economy. An alternative model of production is emerging – both on the internet and elsewhere – that does not rely on market transactions but rather on sharing and cooperation among peers. Production is based on voluntary collaboration and resources are released under specific licenses, such as Open Source and Creative Commons licenses, so that they may be freely used and reused by everyone. This new model of production – sometimes referred to as CBPP² – constitutes the sharing economy, which consists, for the most part, of social interactions outside of the market economy. In the realm of information, Wikipedia is perhaps the most popular example, along with Free/Libre Open Source Software (FLOSS) and Creative Commons, but the same is also true in the physical realm, with a growing number of initiatives such as the Open Source Ecology and FabLabs.

Commons-Based Peer Production (CBPP) is an emerging and innovative model of production, both online and offline, characterized by peer-to-peer collaboration and contribution oriented towards the production of a collectively-owned resource. CBPP lends itself to a different economic system based on the notions of *abundance* and *sharing*, which do not fit within the framework of most conventional economic theories based on notions of *scarcity* and *exchange*.³

To the extent that CBPP operates outside of the market economy, conventional market mechanisms, such as pricing, are unable to give an indication of the overall social value of CBPP – which is based largely on non-market transactions.⁴ In the market economy, the key concern is to assess the economic value (or market value) of things through the mechanism of supply and demand. All other values, such as friendship, solidarity, or even deeper ethical values such as freedom or justice, are regarded as mere externalities which will only be accounted for to the extent that they can be translated into monetary value.⁵

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2. Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, New Haven: Yale University Press, 2006.
 3. Charlotte Hess and Elinor Ostrom, 'A Framework for Analyzing the Knowledge Commons', in Charlotte Hess and Elinor Ostrom (eds) *Understanding Knowledge as a Commons: From Theory to Practice*, Cambridge, MA: MIT Press, 2005.
 4. Robert Schiller, *Finance and the Good Society*, New Haven: Princeton University Press, 2012.
 5. Siegwart Lindenberger, 'Contractual Relations and Weak Solidarity: The Behavioral Basis of Restraints on Gain-Maximization', *Journal of Institutional and Theoretical Economics (JITE)/ Zeitschrift für die gesamte Staatswissenschaft*, 39.5 (1988); Glen I. Cohen, 'The Price of Everything, The Value of Nothing: Reframing the Commodification Debate', *Harvard Law Review*, 117.689 (2003).

Without the traditional system of ‘pricing’, we can no longer rely on a universal unit of analysis (i.e. a value proxy) to assess and compare the value of different CBPP platforms, or to indicate the value individual users contribute to these platforms.⁶ Even when commons-based entities do have monetary value, we cannot rely on the traditional market mechanisms (such as pricing) to assess the value they produce. Hence, we need to identify another indicator of ‘social value’ (other than price) capable of capturing the value generated by CBPP and this will allow us to assess, compare and communicate the value of different entities or projects that operate exclusively in the sharing economy.

Maya would like to show her friends and family, who are not part of the commons ecosystem, the value she is contributing to the world. Everyone knows about Wikipedia, but many people are not aware of Creative Commons, or even smaller initiatives like Couchsurfing. Moreover it is difficult for people to understand the value that these commons-based initiatives yield, even when they are (directly or indirectly) benefiting from them.

Value Metric for Commons-Based Entities

For instance, what is the value of Wikipedia? Does it have a monetary value? – and if so, would it make sense to measure it in monetary terms? We know it has a high social value because of the perceived value others attribute to it – but how can this value be measured? Ideally, we should have a quantified indicator of the approximate social value of Wikipedia or any commons-based entities (from now on referred to as CBEs⁷).

Maya could then describe the value of her work to her family and friends, by simply pointing out the value of the different CBEs she’s contributing to.

Of course, in order to have an indicator, we need an alternative *value metric*, separate from the market one, which will allow us to understand the value of CBEs. We believe that a metric of the social value of a CBE should be constructed on two basic assumptions:

- As an indicator of social value, its value should emerge from the network of involved actors, that is, the CBEs;
- As a subjective value, it should be based on the perception of peers, that is, the other CBEs.

Thus, based on these premises, we propose a value metric algorithm inspired by:

- Flattr⁸, understood as a meter of individual appreciation that translates into donations. Peers may express their appreciation for other peers by clicking on their badge (*flattr*ing them), and anyone can see the amount of flattrs a user receives. (or something e.g.: a blog post, a project, etc).

6. Primavera De Filippi, ‘Translating Commons-based Peer Production Values Into Metrics: Towards Commons-based Crypto-Currencies’, in Lee Kuo Chen D. (ed.) *The Handbook of Cryptocurrency*, Amsterdam: Elsevier, forthcoming 2015.

7. Which are usually named Commons-Based Peer Production (CBPP) communities. Here we use CBE for the sake of simplicity.

8. Flattr is a microdonation web service: <http://flattr.com>.

- Google's *PageRank*⁹, as a means of evaluating the importance of a webpage based on its incoming links. That is, the algorithm calculates a quantification of the social relevance of each node based on the network of links.

In our model, we combine the two in order to achieve a more sophisticated system for estimating the social value of CBEs:

1. Inspired by Flattr, any CBE can *vouch* for another CBE that it considers valuable.
2. Inspired by PageRank algorithm, we can then calculate how many incoming vouches, as opposed to incoming links, a CBE has according to a specific algorithm.
3. Inspired by the fractionality of Flattr, a CBE may assign a particular weight to each one of its vouches (where the sum of these weights given must be equal to 1).
4. Inspired by the transitivity of PageRank, a CBE channels a fraction (a percentage indicated by the vouch weight) of its own social value to the CBEs it is vouching for.
5. The more value a CBE accumulates, the more socially valuable it will be considered. That is, quantity matters: how many vouches I have; and quality matters: who is vouching for me.

We can see an example of this indicator (which we will refer to as 'the social value indicator') in Fig. 1, where Wikipedia has a high value (1,500, and a larger circle) due to its weighted reputation. Couchsurfing is smaller, but it still has a value of 200 because even if it's only receiving a weight of 0.1, it is ponderated with the weight assigned to it from the larger Wikipedia.

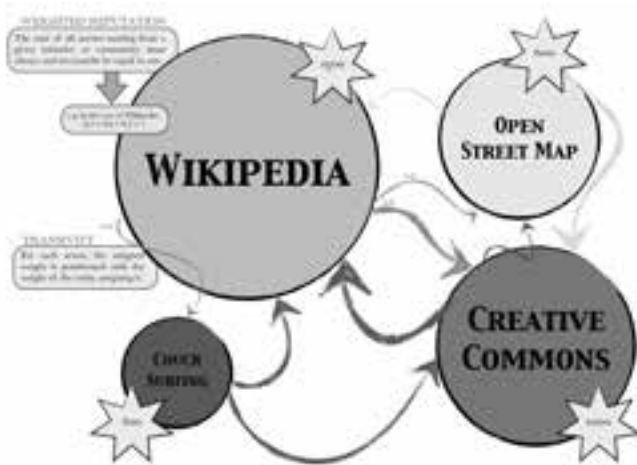


Fig. 1: Example of several CBEs vouching each other with different weights, resulting in a social value number for each.

9. Lawrence Page et al, 'The PageRank Citation Ranking: Bringing Order to the Web', 1999.

As an algorithm, in its simplest form,¹⁰ we can implement it as follows:

For any given entity X, its social value (SV) at time (t) is expressed by the function SV(X, t). SV(W,t) indicates the total amount of *weight* (w) received by X from other entities in the system (A, B, C), ponderated by the SV of these entities:

$$SV(X, t+1) = w(A, X) * SV(A, t) + w(B, X) * SV(B, t) + w(C, X) * SV(C, t)$$

Eq. 1

Taking into account that every CBE can assign weight to others, with a sum which must necessarily be equal to one, the complete formula can be expressed as follows:

$$SV(X, t+1) = \sum_{j \in U_X} w(j, X) * SV(j, t), \quad \text{where } \forall j \in U_X, \left(\sum_{k \in F_j} w(j, k) \right) = 1 \quad \text{and} \quad 0 \leq w(j, k) \leq 1$$

Eq. 2

where

U_X = the universe of all the entities assigning a weight to X

V_X = the universe of all the entities that were assigned weight by X

This specification complies with the definition of *ordered weighted averaging* (OWA)¹¹ aggregation operator in fuzzy logic, and therefore it possesses interesting mathematical properties.

Finally, it is also important to note that the community of communities forming within the system is structurally, and necessarily, biased: it should only be composed of commons-based entities (CBEs) forming a web-of-trust. This requires some kind of pre- and post-filtering or discrimination. For example, how do we prevent Skype from joining, if it claims to be part of the commons ecosystem?

- Firstly, in order to join, a new CBE may need to be endorsed by a certain number of CBEs (algorithm pre-filtering): e.g., one needs to be invited by at least five entities before it may join the system.
- Subsequently, the CBEs participating in the system would self-regulate who belongs to the system (community filtering): e.g., if a large amount of CBEs believe Skype is not a CBE, it may be banned.
- In addition, the system may contain rules that would facilitate the rejection process (algorithm post-filtering): e.g. if no user vouches for an entity for a long period of time, it is a sign that it may be banned.

10. The following equations are a strong simplification, as there are more complex algorithms available. Still, for preliminary testing in a prototype and for the sake of communicating the concept, we'll stick to those.

11. Ronald R. Yager and Janusz Kacprzyk, *The Ordered Weighted Averaging Operators: Theory and Applications*, Kluwer: Norwell, MA, 1997.

Essentially, this would be creating a network-of-trust model, and therefore the initial selection of entities might have a significant impact on the subsequent population of the ecosystem.

Rewards for Contributors to the Commons

Thanks to the social value indicator, we now have a clear indication of the social value each CBE has within the commons-based ecosystem. However, a CBE can do nothing with such an indicator except brag about it. We propose here a possible use for such an indicator, which would allow for the value contributed to the CBE to flow back to where it originated from: i.e. to the CBE contributors.

The (macro) value of CBEs is generated exclusively by the community of individuals participating in (micro) creating content (articles, source code, videos, etc.), discussing, sharing, rating, and essentially contributing to the community. Therefore, the long-term sustainability of CBEs depends on a constant flow of quality contributions, which can only be achieved if the contributors are investing a sufficient amount of time, effort, and resources in the CBE. Therefore, it would be ideal if contributors to the commons could somehow be rewarded for their time and effort.

Today, CBEs, and online platforms in general, can employ different mechanisms to gratify their contributors, by means of both immaterial rewards (e.g. reputation, admin rights and privileges) and material rewards (e.g. virtual currencies and donations) as seen in Table 1.

Value Metrics	Immaterial Reward Mechanisms
Reputation in the system based on the trust by other users (Fiat)	Real reputation (real-world industry reputation)
Quantitative measures:	Power and status in the community, administrative permissions
number of contributions, size (Stackoverflow)	Privileges in the community, vote, quest, quest (FTP media sharing)
popularity of content, votes, likes, shares (Facebook, Youtube)	Qualitative rewards, e.g. congratulations from individuals (Wikihow)
Online social network service analytics (Klout, Kred)	Tokens (medals/badges) received from other's appreciation: Wikipedia, FFP University
Calculation of "karrens" based on "helpfulness" algorithm (Stackbit)	Material Reward Mechanisms
Tokens (medals/badges) received from other's appreciation: Wikipedia, FFP University	Tokens exchangeable for services within the community (FarmVille)
	Donations from individuals, crowdfunding (GoFundMe)
	Unfulfilled donations from the community (Pledge)
	Offers from others to contribute to projects (Free/Open source)

Table 1: A series of examples of existing value metrics and value rewards.

Yet, most of these reward mechanisms are limited by the following issues. On the one hand, rewarding contributors with material rewards – such as money, or a monetary equivalent – may lead to undesirable results:

- If some contributors are paid, others may no longer want to contribute *for free*.
- As more users start contributing *for money*, efforts may shift towards the things that will be the most highly rewarded, as opposed to what people feel the most passionate about.
- Since money is scarce, contributors may start competing against each other, instead of collaborating towards a common goal.

On the other hand, if gratification is limited to immaterial rewards, the situation of contributors is barely improved. In other words, contributors will need to keep doing *those boring tasks that provide them with a source of income* rather than contribute to their favorite CBE: the one which does not know how to reward them appropriately. Besides, given that most of these rewards are CBE-dependant, contributions do not scale well in multiple CBEs. Each reward mechanism is disconnected from each other and contributors cannot aggregate, exchange or compare the value they helped generate in different communities.

We propose here a mechanism for rewarding contributors, which adheres to the following principles:

- It should not involve money, nor any scarce and transferable resource that may be exchanged for money – therefore avoiding the emergence of competitive or individualistic dynamics among contributors.
- It should support people *in the physical world*, who are currently dominated by the logic of the market.
- It should account for the contributions from all CBEs the user may be participating in.

In summary, what we aim for is an interface between the market and the commons-based ecosystem which will provide rewards that are non-transferable (i.e. not currency-based) but that the market may somehow recognize.

Let's imagine that we have such system – the so-called *Sabir* system – for a moment, and continue our story.

The Journey Towards Rewarding Maya

Imagine a world with a flourishing commons-based ecosystem that operates alongside the market economy. In that world, some CBEs would be invited to join a network-based value system, where their value could be established by other CBEs according to their weight in the ecosystem (see the social value indicator in the previous section).

Now, let's assume for a moment that, in such an imaginary world, Wikipedia (WP) has a social value of 1500 and Creative Commons (CC) has a social value of 1000. Maya is a CC video artist and WP contributor; she only has a part time job, because she wants to spend more time on doing what she loves, that is, making CC documentaries and WP articles.

Whoever contributes to the commons is rewarded with a particular set of non-transferable tokens issued by a specific CBE. Each CBE is free to decide the number of tokens it issues, and the manner in which these tokens will be redistributed to its contributors, according to an internal reward mechanism based on gratitude and appreciation. Each CBE has its own token type, that is, its tokens differ from those other CBEs issue.

WP has many contributors, so it has issued 12,500 tokens. CC has only issued 5,000 tokens so far. As Maya participates actively in both communities, she has received 125 WP-tokens and 200 CC-Tokens, which she collects in her portfolio.

In order for people to compare the value of their contributions between different CBEs, the value of each token must be translated into a common denominator of value, Sabir, Sabir, calculated with the following formula:

$$\text{Value of 1 token}(CBE) = \frac{\text{Social Value}(CBE)}{\text{Total number of tokens issued by the CBE}} \text{ sabir(s)}$$

Eq. 3

and therefore, the number of sabirs per person *P* would be expressed by the following formula:

$$\begin{aligned} \text{Sabirs}(P) &= \sum_{\text{every CBE of } P} \text{tokens earned}(CBE, P) * \text{Value of 1 token}(CBE) = \\ &= \sum_{\text{every CBE of } P} \text{tokens earned}(CBE, P) * \frac{\text{Social Value}(CBE)}{\text{Total number of tokens issued by the CBE}} \end{aligned}$$

Eq. 4

Therefore, in the case of CC:

$$\text{Value of 1 token}(CC) = \frac{\text{Social Value}(CC)}{\text{Total number of tokens issued by CC}} = \frac{1,000}{5,000} = 0,2 \text{ sabir(s)}$$

Eq. 5

Hence, Maya’s 200 CC-Tokens are equal to 40 sabirs, and Maya’s overall contribution to the commons is equal to: Total number of sabirs (Maya) = $125 * \frac{\text{SV}(WP)}{12,500} + 200 * \frac{\text{SV}(CC)}{5,000} = 15 + 40 = 55$ sabirs
Maya is really proud of herself, not only can she understand the value that she has contributed to the commons over the past year, but she can also easily express it to her friends.

Gratification

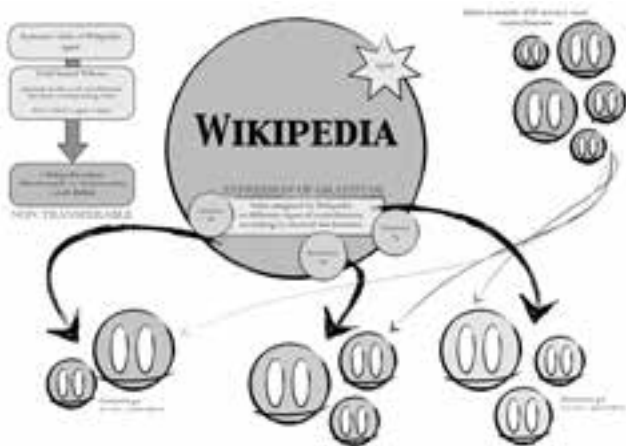


Fig. 2: One CBE (Wikipedia), with its own social value, generates and distributes its own tokens (WP-tokens) to different contributors based on their task.

The system of gratification can be explained by the example shown in Fig. 2. Wikipedia, with a Social Value of 1500 as we saw in Fig. 1, issues 12,500 Wikipedia-tokens (WP-tokens). At this specific moment, Wikipedia is adopting a strategy of prioritizing the quality rather than the quantity of its articles, so it decides to reward article reviews the most, followed by donations and finally the creation of new articles. In the particular example we considered, Wikipedia rewards 20 WP-tokens to all those providing a comprehensive review of existing articles, 15 WP-tokens for each donation over \$200, and 10 WP-tokens for each article created longer than a stub that is accepted by the community. This way, it is providing a reward to its contributors. Even though this has the potential to distort the nature of contributions, if properly used, it can be employed as a tool for the CBE to provide incentives for the most essential tasks. For instance, if a contributor hesitates on whether to create a new article, or review an existing one, she might favor the review based on the higher value it has for the community, as expressed by the internal mechanism of rewards.

The system should ensure that users know what kind of rewards can be earned by which tasks. Thus, each CBE should provide a standard table where these task and gratification is indicated. The more transparent it is, the more the CBE can encourage its contributors to focus on the most urgent tasks. The system should also ensure that each CBE keeps track of how many tokens are earned by each contributor. Therefore, CBEs should provide a standard way for accessing such information, either by querying the contributor's profile, or via an API for people to use their own personal *wallet* – i.e. a software that records all the tokens earned and the sabir value of each token.

Even though the tokens are a quantified expression of gratitude, we are not aiming to *quantify everything*. These rewards can be earned according to *internal rules* chosen by each CBE, and such rules may be quantitative or qualitative, and may refer to:

- Projects for which people can earn a particular number of tokens. Rewards may be based on both quantity (e.g. number of words) and quality (e.g. three or more approvals from librarians).
- A role which provides a salary-like remuneration. This may be common for maintenance and caring-related roles, e.g. Wikipedia administrators might earn 5 WP-token per month.
- Other surprise rewards. Tokens can be distributed as prizes to really productive or skilled users that did remarkable contributions. Some users may also be given administrative rights to distribute a certain quota of tokens as they see fit.

WP-tokens are generated on demand: Wikipedia can issue as many as they want, is other words, no *a priori* artificial limitation is imposed. Unlike real money and most virtual currencies (e.g. Bitcoin) it is not essential for these tokens to be scarce. Besides, these WP-tokens are non-transferable: a contributor cannot *sell* her tokens to someone else, nor exchange them. Finally, the value of each WP-token is different than the value of each CC-token: the value depends on the actual social value of the CBE issuing them, and on the amount issued.

We propose here a simple way to normalize the value of all those CBE tokens, through our common denominator of value, *Sabir*: a quantified indicator that approximates the

value of all contributions that a user has made to the commons. Such an indicator is easy to understand not just by the contributor herself but also by others, who may not be acquainted with the particular CBEs to which the contribution was made.

Interaction with Market Players

Sabir can essentially be regarded as a proxy for value in the commons-based ecosystem. Like the role of pricing in the market economy, Sabir allows individual contributions to be assessed and compared according to a common denominator of value (which remains distinct from market-value). While price is linked to a particular service or product of exchange, Sabir is an expression of the value that a particular individual contributed to the commons over a lifetime, and should therefore remain linked to that individual over their whole lifetime (i.e. it is not transferrable).

As a common denominator of value, Sabir establishes a common language (a *lingua franca*), and acts as a bridge between the commons and the market economy, so that the two can benefit from each other, without one actually taking over the other. Indeed, by introducing a quantitative denominator of value for commons-based contributions (similar to pricing in the market economy), Sabir makes it easier for market entities to understand the value generated by CBE contributors to the common good, and reward them accordingly. Hence people who make a large contribution to the commons but remain outside of the market economy, may eventually be able to gain recognition from commercial players. Perhaps some of these market players would provide free or discounted goods or services to significant contributors.¹²

Maya's part-time job doesn't provide her with a sufficient income. Fortunately, there are several market entities, popular among CBE contributors, who recognize the value of her work. Once a week, Maya can have free lunch in a local restaurant whose owner is also a CC artist, and she gets a free license for Adobe Photoshop.

From a commercial perspective, Sabir enables market players to price-discriminate between standard customers and CBE contributors, potentially restricting their offers only to those people who contributed at least 'x amount' of Sabir to the commons.

Maya loves to record her songs with commercial recording software but the license is expensive. Fortunately for Maya, the software company provides free licenses to anyone who has contributed over 10 sabirs to the Free/Libre Open Source Software community.

Since Sabir is an open value system anyone could potentially assign value to CBEs according to their own value metrics. For example schools or universities could apply an 'education' matrix, giving greater importance to Wikipedia and Creative Commons. Whereas a local restaurant might apply the 'slow food' matrix, giving more weight to local farmers and producers. Therefore, the previous Eq. 4 could be customized by a third-party (M) as follows:

12. This is already happening, albeit in a very limited way: e.g. Github provides free (*as in beer*) services to FLOSS accounts, Bambuser provides premium accounts to journalists and activists, and SafeCreative provides a restricted amount of 'all rights reserved' registrations.

$$\text{Sabirs}(P, M) = \sum_{\text{every-CBE-of-P}} \text{tokens-earned}(\text{CBE}, P) * \frac{\text{Value-Matrix}-M[\text{Social-Value}(\text{CBE})]}{\text{Total-number-of-tokens-issued-by-the-CBE}}$$

Eq. 6

In other words, the third party may apply its customized *value matrix* to the already given social value of the CBEs. However, not every third-party needs to build their own matrix: they may use the standard social value (Eq. 4), use their own customized matrix, or use a matrix deployed by others. For example, Github may use the standard social value, a customized *Value_Matrix_Github*, or the *Value_Matrix_FOSS*, a common matrix used by many within the Open Source Software realm.

Maya is a good student; she's smart and very passionate about the topics she loves. She spends a lot of time on Wikipedia, researching and reporting her findings together with a community of other enthusiastic users. Her school recognizes the value she's contributing to the 'Commons' and gives her better grades for that. On the other hand, the university looks at the commons through an 'education lens' which assigns greater value to academic institutions such as Wikipedia or the P2PUiversity, but does not recognize other CBEs such as Couchsurfing or other non-academic CBE platforms.

Individuals can choose whether to work for the market (earning money) or for the commons (earning sabirs), without necessarily having to give up one for the other. By providing an interface between the commons and the market economy, Sabir might ultimately encourage people to contribute to the commons in order to benefit from the special deals provided by certain market entities to CBE contributors.

Eventually, as more market entities recognize the value of Sabir, and CBE contributors accordingly, Maya will be able to spend more time doing what she loves, contributing to the commons, while benefiting from the products and services offered by the market without having to interact directly with the market economy.

Over time, a positive feedback loop is established, as commercial entities that support the commons will gain reputation in the commons-based ecosystem. Ultimately, this would lead a larger number of people to purchase their products or services.

Each time Maya discovers a new entity that supports the commons, she gives them a good rank, and tells her friends about them. Whether or not they are CBEs contributors themselves, they will nonetheless be happy to purchase the services offered by that entity, knowing that they are also helping the commons.

In Fig. 3, we illustrate the benefits of the Sabir system, as an interface between the market and the commons-based ecosystem. Nowadays, Maya is contributing to various CBEs but, since she's not earning any money from this contribution, she cannot benefit from the products provided by the market system (burgers and ice cream from McDonald's in this example) unless she actually decides to play the market game by getting a wage-paying job. In the future, thanks to Sabir, Maya will be able to express the value that she has been contributing to the commons through a common denominator (the amount of sabir she has accumulated), which can easily be understood by market actors. In this example, McDonald's recognizes the value of the commons and

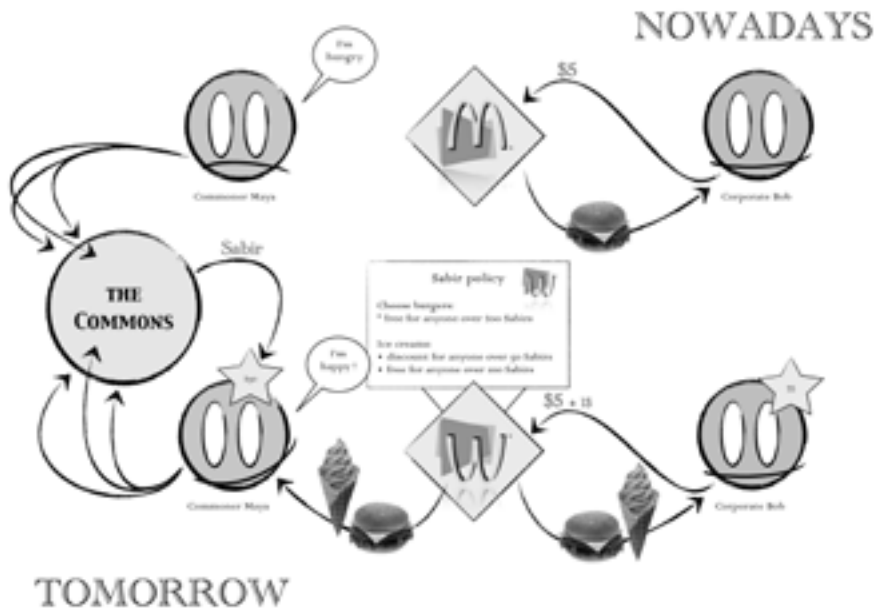


Fig. 3: Example illustrating the current state of affairs for contributors to the Commons and how Sabir may help change it.

has implemented a specific policy to reward CBE contributors with free burgers and discounted ice creams, depending on the value of the contribution to the commons. Hence, Maya is happy since she can continue contributing to the commons, knowing that the time she spends doing so will count towards obtaining free burgers and ice cream from McDonalds. Bob also contributed to the commons, but to a lesser extent, and therefore he is only entitled to a discount on the ice cream.

Implications and Benefits

In a nutshell, the proposed system can help (1) measure CBEs social value (2) distribute non-transferable tokens to relevant contributors and (3) facilitate the process of rewarding contributors by market entities. The system presents a variety of benefits for the various actors involved, as follows:

For Commons-Based Entities

Understand CBEs' Perceived Systemic Value

From the perspective of CBEs, the clearest benefit of Sabir is that it allows for each CBE to understand its own value within the CBPP ecosystem thanks to the social value metric – or at least, an approximation of how it is perceived by others, and its evolution over time. For example, a decrease in the social value of a CBE may be regarded as a sign for a variety of things, e.g. poor relationships, bad communication, or perhaps just a lack of focus on what really matters. Without the social value metric, CBEs would remain ignorant of how they are perceived by other CBEs.

Encouraging Participation and Growth by Means of a Reward System for Contributors

Another benefit of Sabir is that it *facilitates the elaboration of a system of internal rewards for estimating the value of contributions*. This is a typical issue for many CBEs, they are interested in reward systems in order to promote participation, but still there are problems. Reputation systems can be risky, as they may trigger unexpected changes within communities and current reward mechanisms have many issues. With Sabir, the introduction of non-transferable CBE-dependant tokens can be done in a gradual and systematic manner. This would minimize the risks and, if the experimentation fails, it is easy to revert back to the initial state of affairs.

Attract Contributors and Direct Their Contributions Where they are the most Needed

A third benefit of such a gratification system is that it would likely *increase the participation and growth of the community of contributors*, while also providing a means to *direct the contributions to where they are most needed*. CBEs might not only be concerned with increasing participation, but also in promoting a certain type of contribution (donations, maintenance, technical tasks, filtering, etc.) that is urgently required but lacking.

For Commons-Based Contributors

Understand the Value Contributed to the CBEs and to the Whole Ecosystem

Similarly to CBEs, a direct benefit for contributors is the ability to understand the value they are providing both to the whole commons-based ecosystem (expressed in sabirs) and to each individual CBE (expressed in their own gratification-tokens). This is particularly useful to the extent that individual contributors can compare the value they contribute to different CBEs and understand where their contributions are most required. They may even switch to another community where their contribution is more appreciated. While it might seem like a loss to the community, it is better that the contributor acknowledges the fact that her contributions are not being appreciated, in order to reduce the possible frustrations which might lead to other contributors leaving the community.

Communicate the Value of One's Contribution to the Commons

By providing a common denominator of value, which applies equally to all CBEs, Sabir makes it easier for 'commoners' to communicate the value they have contributed to society, and may even encourage others to join and contribute to the commons as well.

Receive Direct Benefits From the Market Entities Recognizing Sabir

The main benefits for contributors is obviously those coming from market players that recognize Sabir as a reliable indicator of the value that has been contributed by each individual to the commons-based ecosystem. With a growing community of commoners and market entities joining the system, Sabir may engender profound change and reduce dependence on traditional market mechanisms.

For Market Players¹³

Direct Economic Benefits Through Price Discrimination

Market players can engage in price discrimination, by means of customized pricing policies which allow them to allocate some of their resources to the commons, without noticeably altering the market price. For instance, a software company could offer particular benefits to open source contributors by means of specific licenses (akin to the 'educational' licensing schemes for students or universities). The advantage of such particular kind of price discrimination is that it does not theoretically effect the market price, because only commons-based contributors will be able to benefit from it.¹⁴

Indirect Economic Benefits as a Result of Greater Visibility and Reputation

Although they do not receive immediate economic returns, it is common practice for many market players to support commons-based initiatives, such as social, cultural, or educational programs, in order to gain greater visibility. With Sabir, market players can support the commons-based ecosystem without having to distinguish between different initiatives which they would prefer to donate their resources to. Instead they can indirectly contribute to the commons-based ecosystem as a whole, simply by showing appreciation to anyone who contributes to the commons and rewarding them accordingly. Although commercial entities maintain the right to assign more value to some initiatives over others. Market players participating in the system might benefit not only from greater visibility or reputation, but also from collateral economic returns, as people who share the same values will be more likely to purchase from them. Besides, those who benefit from discounted and free goods or services will also be more likely to purchase other goods or services provided by these same companies.

Self-Realization

Although, in most economic theories, market players are described as rational beings acting according to their own self-interest, in practice, behind the commercial façade there are also human beings with principles and ideological values that might go against traditional economic rationality. Hence, certain market players might be tempted to participate in the commons system for ethical reasons and to support the projects that reflect their own values and, more generally, by contributing to help make the world a better place.

Systemic

Interface Between the Market and the Commons-Based Ecosystem

From a systemic approach, the main advantage of Sabir is that it acts as a bridge between the commons-based ecosystem and the market economy, without necessarily favoring one over the other. Today, the market can take from the commons, i.e. it can benefit from the outcome of CBPP, without ever giving back to

13. We refer here to market players as any entity that subsists within the market economy and operates according to the logic of the market.

14. Of course, as more people contribute to the commons, the system might lead to a progressive drop in market price. Yet, this is only a marginal problem since market players maintain the right to update their commons policy at any time, in order preserve price-discrimination.

the commons-based ecosystem. Therefore, it is to some extent free riding over the commons (which are in this sense subsidizing the market economy). Conversely, the commons-based ecosystem cannot benefit from any of the goods or services that the market provides, unless it actually adopts the logic of the market, which necessarily entails the commodification of commons-based resources.

Cooperation Without Contamination

Thanks to Sabir, the two systems can keep operating according to their own rationale: *abundance, collaboration, and sharing* for CBPP, *scarcity, competition and exchange* for the market. Nonetheless CBPP and the market are able to interact with each another without the risk of contamination. Individuals can choose whether to work for the market (earning money) or for the commons (earning sabirs), without having to forgo one for the other. As Sabir becomes more widely adopted, people will be able to spend more time doing what they love, contributing to the commons while also benefiting from the market economy.

Positive Feedback Loop Between the Commons and the Market System

As a result, Sabir might encourage people to contribute to the commons in order to benefit from the deals provided to CBE contributors by certain market entities. Over time, a positive feedback loop will therefore be established, as market entities that support the commons will gain reputation within the commons-ecosystem. This may, ultimately, encourage more people to purchase their goods or services, knowing that are also supporting the commons.

Concluding Remarks

The value of CBPP has been widely acknowledged over the past few years.¹⁵ Accounting for the value produced by different CBEs and determining the relative value of each contribution is a worthy endeavor, however difficult it may be to achieve. Currently, there are still no proper tools capable of understanding the value of CBEs or estimating the value generated by their community members.

The Sabir system combines some, but by no means all, characteristics of a credit score, a cryptocurrency, and a reputation system in order to provide an indicator which acts as a proxy for *social value*, as opposed to *market value*, in the commons-based ecosystem.

As individuals contribute to the commons, they receive 'gratitude' from the CBE they have contributed to which is expressed in their own gratification-system, i.e. the CBE tokens. As a common denominator of value, Sabir represents the *lingua franca* between these different systems. It translates the gratitude generated by individual contributions into a numeric value according to an algorithm (standard or customized through a value matrix) ponderating every contribution within the overall social value of

15. David Cheal, *The Gift Economy*, New York: Routledge, 1988, pp. 1-19; Lorna Gold, *The Sharing Economy: Solidarity Networks Transforming Globalisation*. Burlington: Ashgate Publishing, Ltd, 2014; Michel Bauwens, 'The Political Economy of Peer Production', *CTheory*, Vol. 1, (2005); Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, New Haven: Yale University Press, 2006.

the commons to which they contributed (see Equation 3). As such, Sabir makes it easy for anyone to assess the value produced within a particular CBE and to compare the values of different CBEs among each other.

Through Sabir, we can benefit from the advantages provided by a universal indicator of value, without falling under the restrictions of conventional economic theories. Indeed, just like the role of pricing in the market economy, Sabir allows for individual contributions to be compared according to a common denominator of value. Yet, the value expressed by Sabir is not the actual *market value* but rather the *value that emerges from every contribution to the commons*. In other words, Sabir acts as a proxy for the value of individual actions within the commons-based ecosystem. Hence, as opposed to price – which is linked to the product or service of exchange – Sabir is ultimately linked to the individuals contributing to the commons. It is, therefore, important not to confuse Sabir with an actual currency (or cryptocurrency). As opposed to conventional currencies, which can be transferred from one individual to another, the Sabir indicator should be associated with the same individual during her whole lifetime, i.e. it is not transferrable although, just like price, its value may fluctuate over time.

Yet, measuring the value of CBPP within a non-market economy raises an important question. It is unclear, at the moment, whether the introduction of a system like Sabir, offering a formalized, personal indicator of value is likely to increase people's motivation to contribute to the CBPP ecosystem, or whether it might, on the contrary, disrupt that particular set of motivations which have been established thus far.¹⁶ Could CBPP values (such as freedom, sharing, or cooperation) actually be translated into quantifiable terms, without incurring a loss?

Acknowledgements

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16. Yochai Benkler, 'Peer Production and Cooperation', forthcoming in J.M. Bauer and M. Latzer (eds) *Handbook on the Economics of the Internet*, Cheltenham and Northampton: Edward Elgar, 2015.

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**DEMOCRATIZING
THE POWER OF
FINANCE:
A DISCUSSION
ABOUT ROBIN
HOOD ASSET
MANAGEMENT
COOPERATIVE
WITH FOUNDER
AKSELI VIRTANEN**

**PEKKA PIIRONEN
AND AKSELI VIRTANEN**

DEMOCRATIZING THE POWER OF FINANCE: A DISCUSSION ABOUT ROBIN HOOD ASSET MANAGEMENT COOPERATIVE WITH FOUNDER AKSELI VIRTANEN

PEKKA PIIRONEN
AND AKSELI VIRTANEN

Pekka Piironen: What is Robin Hood?

Akseli Virtanen: Robin Hood is an asset management cooperative established in June 2012. It is a counter-investment bank of the precariat, which rethinks the means of finance and financial services. We bend the financialization of economy to our benefit. Robin Hood has the power and imagination to do this.

Pekka: How does it work?

Akseli: We operate a massive dynamic data-mining algorithm – we call it the ‘Parasite’ – which logs into the brains of the bankers on Wall Street, and they don’t even know it. We know exactly what they do and when. We know who can make money consistently with certain instruments and who cannot. Robin Hood is our means to share this knowledge. In the first year, the value of our portfolio rose 30.74%. With this result we were the third best hedge fund in the world. Now, after the second year, we are up 40.15%.

Pekka: Some time ago the biggest Nordic newspaper headlined ‘Robin Hood robs from the financial elite. Asset management for those without assets.’ Is the mysterious Robin Hood Co-op an investment club, art, or philosophy?

Akseli: Asset management for those without assets is quite a good headline. We talk about minor asset management. That’s our business.

‘Minor’ originates from Gilles Deleuze and Félix Guattari’s conceptual toolbox. They took it from Kafka’s diaries, where he talks about authors writing in major languages who were able to transform their work into something else, by making the work crumble and stammer, by operating in the tissues and edges, from within, through the same language, but turning it into something else, making it their own. It is an attempt to think about political means, means of change, where there is no outside. Minor is something that always brings together the personal and political. It is always about making our existential territories more habitable. And it is always something collectively produced. It changes power relations by changing the conditions of the situation. It allows for ‘a people to come’ by opening new routes and processes of becoming.

Robin Hood practices a special way of managing assets that makes something new possible in a situation when nothing new seems possible. It is a becoming. This is our invention. At the same time it is also management of the assets of minorities, in Kafka's sense, who will and can never become major, but will always remain like spit in the salad. And it is this management of minor assets, small assets, that is our other particularity. A lot of small assets working together. We don't mind the connotation of being underage – not legally responsible, a minor, in a process of still becoming – neither as an attribute to our way of managing assets or to the assets managed, there is something true there.

'Investment club' is also an exciting choice of words; I don't exactly know what it means. We are a normal Finnish company operating under Finnish law. The form of the company is a cooperative. And we are in the middle of establishing the American Robin Hood in Silicon Valley.

We certainly embody a philosophy – especially in so far as we can think that the task of philosophy is to create new concepts or new little machines which correspond to real problems – but politics might be more understandable in terms of our context, starting points, and aims. Is Robin Hood business, art, or politics? This is an interesting starting point for any discussion.

Pekka: Why the name Robin Hood?

Akseli: Everybody knows what Robin Hood does. In the age of semiotic inflation and information overload, we don't want to spend too much time explaining. You need to get it in a different, immediate way.

The roots of Robin Hood are in the British Forest Law, which allowed Norman kings to add more and more common forest areas under their ownership. Villages, houses, fields, and even churches were destroyed to add new land to king's forests. Inhabitants of those areas were thrown out without food, resources, opportunities, or prospects. They had very limited options for survival, some caved, some became informers, con-men, traitors, and other forms of opportunists. The local officers became corrupted by providing their services to those who could pay. And the punishments were severe: Robin Hood got the death penalty for poaching the king's deer in Sherwood.

Pekka: In a sense not that different from the situation today?

Akseli: Now, six hundred years later, we see new 'Forest Laws' to be enforced everywhere, and the common is again under threat. We need the financial services of Robin Hood, our methods are just a little different due to the changed circumstances: now we follow all transactions at the U.S. stock exchanges, make databanks of market actors, deconstruct them from individuals into individuals to extract their most important knowledge and capabilities, and to put them to work for us. But the consequences are the same: the Sheriffs of Nottingham are clueless when they can't withhold the king's deer, or guard the routes of the wealth expropriated from the people. Robin Hood's business is minor asset management. It means sharing and democratizing the power of finance. This is now off limits to us.

Pekka: You have talked about Robin Hood as a parasite of financial economy, providing access to money that is not tied to the necessity to work.

Akseli: First of all, parasite is a concept of Michel Serres. What is important here is what it tells of the relationship we have with the financial market and its players. We let them do all the work and just imitate them. Why? Because, as Serres writes, the one who plays the position will always beat the one who does the content. The latter is simple and naïve, the former complex and intelligent. By playing the position we dominate the relationship. It means that we have a relationship with the relationship itself. It is the meaning of the prefix 'para' in the word parasite: to be on the side, not on the thing, but on the relationship. A parasite has relationships; it makes a system out of them.

Secondly, today there is an asymmetrical division between those who are able to create money by transforming it into financial capital (to earn money as separate income without a necessity to work) and those whose only access to money is to work, possibly at any cost and condition – or first take on debt, and then work. And furthermore, these two forms of money, the money you get for doing work (money as means of payment, money as means of exchange), and money as capital, have very different powers. Or more precisely, the former has no power at all, it is money castrated of any power, while the latter has a power to organize and command the future, to reduce and submit what will be (all potentiality, change) into what is now (existing power relationships). It represents nothing; it has no equivalent, except in future exploitation of labor, nature, and society.

Robin Hood challenges this debt mechanism of control and of limiting our future. We also offer this other group of people a possibility of income, which is not tied to the necessity of work. An access to money as capital. It is a very concrete opening of the field of possibility. It is an element of independence. That is why we can talk about democratization of finance or of profanation of finance. By taking something sacred, which we are not allowed to touch or which only the priests can touch and understand – just think about the economy, the financial market and its priests today – we are returning it to common use and play.

Pekka: Robin Hood has been described as a 'freak in the world of banking', established by a group of professors in economics and the arts who work at the Finnish Aalto University.

Akseli: This is true, even if the professors were maybe not the majority in this group. The founding members of the cooperative were: Tero Nauha, Karolina Kucia, Liisa Välikangas, Heidi Fast, Kari Yli-Annala, Jan Ritsema, Sakari Virkki, Teemu Mäki, Ana Fradique, Lauri Kananoja, Valentina Desideri, Pekka Piironen, and Akseli Virtanen. There were years of preparation and building of momentum before this. On the board at the moment are Jan Ritsema, Tere Vaden, Liisa Välikangas and Tiziana Terranova, and myself. We have over three hundred members from fifteen different countries and are about to move to the next level of the operation.

Pekka: You have talked about Robin Hood also as a 'hedge fund of the precariat'.

Akseli: Our aim is to bend the financialization of economy to the benefit of those who have thus far been paying its costs: workers at the mercy of the precarization, suf-

fering from the insecurity of labor markets and social rights, growing indebtedness, decreasing price of labor, and of the downsizing of the welfare state. That states quite clearly the relationship of our starting points. Disinflation is the monetary relationship of the financialization of capital and precarization of work. We see this now very clearly in Europe. How is it possible for these deficits to exist without any inflation? Because the logic has changed, the logic of derivatives has provided a means to manufacture liquidity, which does not devalue the base currency. At the moment our collective capacity to assume debt and pay taxes and be the direct bearer of austerity measures – for governments to downsize and spend less for one simple reason, to be able to borrow more – creates direct vehicles for financial asset accumulation (which is not investment in expanding production). The increasing supply of government bonds (safe means for capital preservation) is possible only through deficit cuts and excluding all inflationary spending. This is like the financial equivalent of raw material for industrial production, like Robert Meister has said so well. In the financial economy the surplus is extracted more directly from this collective capacity to become more indebted and pay taxes than from the stagnating number of people employed to goods and services production. Today the growth in the forms of indebtedness is the condition for capital accumulation, just like expansion of labor force participation was for expanding commodity production.

In this situation, Robin Hood operates exactly like the hedge funds and not like a 'retail fund' of a bank. Robin Hood owns stock in other companies as the only asset, and operates with greater flexibility than banks. The investments of members are open ended and withdrawals are allowed only at certain moments of the fiscal year. The value is calculated as a share of the Net Asset Value (NAV), meaning that the increases and decreases in the value of a cooperative's investment assets and expenses are directly reflected in the amount a member can later withdraw. This is exactly what hedge funds do too, but what Robin Hood hedges, is precarity: we take a position in the financial market to offset and balance risk adopted by assuming a position at a contrary market, the precarious labor market, where so far people have just been paying the bills of financialization by letting it use our capability to assume debt, pay taxes and worsen social rights as the main raw material for accumulation of financial assets.

Robin Hood's asset management is based on the idea at the origin of the derivative market: it is possible to produce new assets by means of hedging existing ones. Finance is essentially a technology to create spreads – through creation of doubts, uncertainty, volatility, constant threat of illiquidity – that are valued and can be arbitrated. Robin Hood is using in quite an intelligent way the same new capitalist financial alchemy of turning uncertainty into rent.

Pekka: By this you mean the Parasite algorithm, which takes advantage of the spreads and volatilities of the stock markets?

Akseli: From the beginning we said that we are utilizing the inefficiency of the financial market and our understanding of how public opinion, or market sentiment, organizes the multitude of actors at the market. We do big data. The Parasite, which Sakari has designed and developed, follows all the transactions at the U.S. stock markets, identifies the spreads, the best actors, follows their swarming – and then imitates the emerging consensus action of the financial oligarchy. Quite simply, the assets of the

cooperative are invested at the market by following and imitating the emerging consensus action, or swarming, of the world's best investors on each particular stock.

Our Italian friends Christian Marazzi, Carlo Vercellone, Andrea Fumagalli, and Stefano Lucarelli have been writing about how money in its finance form escapes the public control, the control of monetary institutions like central banks, and becomes a prisoner of the conventions of the oligarchy of the financial market. Robin Hood works with the emergence and exploitation of the conventions of the oligarchy on the market: we tax them for exploiting our collective ability to pay taxes, bear austerity measures and become more indebted. Andrea and Stefano are absolutely right when they say that the governance of the conventions is the proxy of the expropriation of the common. We tax this expropriation.

The hypothesis of the efficient market is, by the way, one of the most important truths of the current economic policies. Our operation is based on a completely different understanding of how the market works and what the mechanisms of creating economic value today are, for example: the role of flock behavior, origin of imitation, and means of controlling a swarm in this.

Pekka: Some people would say you are just following a computer program.

Akseli: It is funny when the Parasite and Robin Hood are interpreted like this. We are dealing here with a little bit more than 'a computer program'. For example, the whole Polemos book series we did in early 2000 in Finland was created for building this understanding and organization. These are wonderful books, 14 altogether, published in this series, from the best economic and political thinkers at the moment. For example, Christian Marazzi's *Language and Capital*, Maurizio Lazzarato's *Revolutions of Capitalism*, Paolo Virno's *Grammar of Multitude*, Franco Berardi's *Info-Labour and Precarious States of Mind*, Bracha Ettinger's *Co-Poiesis*, Félix Guattari's *Chaosmosis and Three Ecologies*, also your book *Economy of Insecurity*, my book *Critique of Biopolitical Economy* and the famous *Dictionary of New Work* which was based on a long lecture series we organized at the School of Economics. It is important to understand that the Parasite coded by Sakari is the essential part of the operation, but what is really important is the approach behind it, that is, the understanding of the changed nature of creation of value. That is why we are now capable of coming up with new products too. I don't know how I could emphasize this more. It sounds so funny, when somebody just says that here are these dudes investing based on a program – I mean after all the research and intellectual investment, years of theoretical and experimental work we have put into this. And there is the massive empirical testing of the Parasite carried out over six years 2003-2009 at the U.S. stock markets, and even more importantly, Sakari's research work on the algorithmic production and product development with the Parasite has been actually going on for more than 20 years. Robin Hood has not just dropped from the heavens.

Pekka: Robin Hood has been in operation for two years. The co-op opened an office in June 2014 in Stuttgart, and then one in Berlin and Dublin.

Akseli: The 'office' is a work form that suits us. We can set it up in any space, in a café, a museum, a park, a university. We call it an office, a temporary office, where we

work like one does in the office... or how we imagine one works in the office...usually on particular themes like aesthetics of algorithmic production, rethinking financial services, crypto currency and equity, processes of the production of the common and some legal issues depending on what is on our immediate agenda. But the office is open and anybody is welcome to listen or join us in the work.

It is hard to get our people to the same place and time as everybody is so 'busy' and production has become spatially boundless and temporally endless. And the offices are not gardens of Zen, but full of conflicts and uneasy moments. It is very hard to work together. And we require that the organizers put their ass on the line too, open their networks, help us meet key people who could be interested in Robin Hood, of cultural institutions (funds, museums, galleries), and from networks of real finance money, funds, wealthy individuals and artists, angel investors interested in production of common fare, disruptive financial services, impact investments, venture philanthropy. We don't organize to run Robin Hood, we run Robin Hood to organize.

Pekka: You draw an international audience: artists, activists, philosophers, and professors. I saw the images of the Stuttgart office and it was full of diagrams and words like 'aesthetics of algorithmic production', 'subjective growth', 'dividual', 'exhaustion of possible', 'machinic surplus value', 'common-fare', 'relations'. Some radical philosophers like Foucault, Deleuze and Guattari were dropped in the stream of the discussion as easily as I used to smoke Marlboroughs.

Akseli: We are researchers of economy and organization. Already during the mid 1990s we found out that it would not be a picnic when we started using thinkers like Michel Foucault, Jacques Derrida, Gilles Deleuze, Félix Guattari, and then the Italian post-operaist writers to study and understand economy instead of the mainstream economic and business theorists. Yet, without caring too much about the consequences, we continued with the work because we knew that we were right – that this was the right way if we wanted to really understand how economy and its organization works today. So with these thinkers we were able to understand, for example, how signs and meanings are part of real production and not only some kind ideology or superstructure of production; how the use of language can have real effects; how the dynamic of the production of value is in the organization of a heterogeneity, of heterogeneous forces, and not only in the relationship between capital and labor; and how it is possible to control not only actual but potential action and thought. With them we also understood the blurring of the boundaries between economy and politics and how the paradoxes of immaterial production – for example, that relations have weight and the immaterial matters – cause problems to old approaches and distinctions, and that we need new concepts and methods if we want to understand what is going on. Some of the key issues of the production value in economy today, like how to create a public, get its attention, keep and modulate it, have already been thought through quite precisely in classical philosophy, rhetoric, and dramaturgy, in semiotics and linguistic theory.

Pekka: As Robin Hood is connected to the ideas of basic income, is Robin Hood trying to overturn capitalism through the stock exchange?

Akseli: Yes, the arguments for basic income are, in fact, quite similar. Our methods are just taken a little further. But 'overturning' belongs to the political means of the last

century and not those of Robin Hood. What is important for understanding Robin Hood is to understand why the old political means of building independent life do not work anymore and why we need to invent something new.

The algorithmic and machinic functioning of economy today operates with component parts of subjectivity; with its sensations, cognition, memory, physical force, intelligence, affects, not-yet-individuated potentialities. Their synthesis does not lie in the person but in the machinic assemblage. What the person 'wants' or 'wills' is absolutely irrelevant. And we see this so clearly: no matter what we say, vote, demonstrate, argue, occupy, strike...nothing changes. The new mechanisms of value production do not work with individual subjects, but with their deterritorialization into individuals. And that level does not involve representation or consciousness, it does not operate through repression or ideology, it takes us from the behind, from the inside, and from the outside.

Our conclusion has been that also we need to start operating beyond persuasion, beyond communication, taking the game outside of identities and 'self' and towards individuals, incremental desire, and imitation, information deficit and fundamental distrust. The game of becoming a member of Robin Hood is played here and not at the rational-cognitive level. We need to take advantage of the ongoing deterritorialization and move towards politics of individualism and not try to return to a 'subject of interest' or rely on programmatic politics of 'cognitive persuasion' or fall back on mythical-conscious narratives of the 'worker', 'employment', 'welfare', etc. It means engaging financial capital where it draws its power: in its paradoxes, in its arbitrariness, in its individualism and not on rational decision-making and market-based organization – they are not the problem here.

Pekka: Could you elaborate on what Robin Hood's relationship with art is?

Akseli: We use art to camouflage, but more importantly to produce aesthetic surplus value, by trying to engage directly with art's power to create unforeseen and unthinkable (economic, political, social, emotional, organizational...) processes. It is also interesting to ask, like Florin Flueras and Alina Popa have said many times, what does Robin Hood do to art? It is non-representative, non-visual, non-performative, non-conceptual and it does not operate within the safe environment and castrated power space of 'Art'. Rather it uses art as an essential part of social organization, economy, politics and life – like art was used before it became something separate with its own axiological reference system, you know, in 'primitive' societies where for example dance, sound, plastic forms, signs on the body, ground and objects were essential part of the political organization, rituals, religious processes. From our perspective this is just pragmatics: we don't give a shit if Robin Hood is art or politics or business, we are interested in what we can do with it; what are its effects, does it make our existential territory more habitable or not?

Pekka: Robin Hood was originally a project in the Future Art Base coordinated by you for the university. The School of Arts presented it as a university level top priority strategic initiative in October 2012. But after information on Robin Hood reached the highest management of the university, you were told that the financing for the whole Future Art Base would be terminated immediately. They said 'Robin Hood is potentially dangerous to the reputation of the university'.

Akseli: It was a surprise that they did what they did – quite simply we were just fired – without even trying to find out what this project was about. Or I don't know, was it surprising at all? More likely we were just naïve to think that something like this could be done there, it still makes me blush. It is an extremely conservative environment where no risks are taken. For them it was a hygienic preemptive action. I want to say this because we had prepared Robin Hood very carefully together with lawyers; we knew that there was nothing 'illegal' about it.

Pekka: You have said Robin Hood is 'is unallowable, impossible and disgusting... a monster... but it corresponds to our subjectivity'. What is this subjectivity?

Akseli: There is no heroism in the exhaustion and disillusionment we are experiencing. We have elsewhere described ourselves as a group of losers, sad figures, dark souls, cynical opportunists, and depressed princesses. We are not tough or macho, we are soft and wet, impotent and feeble. We don't march or demonstrate. We have difficulty in getting out of the bed. We need each other just for trying to stand up. We are 'molle' people,¹ the future of cooperation. This skepticism is not cognitive but ethical. The impasse is ethical and political at once; it affects our position, our exploration of the world. It is the dead end of politics as we have known it, which is the breeding ground of Robin Hood. Robin Hood is belief in this world, and not in some other.

Pekka: The art audience at Documenta found it difficult to stomach the performance by such merry men and women of Robin Hood.

Akseli: It was a fairly elaborate installation or performance, whose form was a paradox. A lot has been written about it, but I can say it again: Robin Hood is an attempt to think about the possibility of cooperation in a condition where it seems that distrust, suspicion, and exploitation of others has become the most important means of our survival. We have talked about these as the precarious states of mind. What does a cooperation of opportunists look like? How does a community of depressed people function? Or cooperation in a situation where we are exhausted by the fact that we need to put all our thoughts, feelings, tastes and relationships to work all the time in every short-term project we get. These states of mind are organic parts of the way in which the economy works. Economy has become a production of subjectivity. Here is also the reason why the old political means – like solidarity, creation of a collective conscious subjectivity, creation of your own values – are not operational anymore and we need to create new forms, paradoxes, monsters which don't fit to the normal flow of thought and action and may seem disgusting, especially from the perspective of the old morality of the left.

Pekka: The artistic director of Documenta 13 accused you of concentrating only on money?

1. The soft belly – *il ventre molle* – of Infosphere is a concept by Franco Berardi. He developed it to think about the place of insurrection and mutation when controls have become arbitrary and start to operate through linguistic and technological automatisms, which predispose our aptitudes, tendencies and positions at a diindividual level. It is no use to rebel or demonstrate against them, it means nothing to their functionality. Yet their weak spot is in the softness or unpredictability of social sensibility and unconsciousness. It is their 'soft belly'.

Akseli: Carolyn Christov-Bagargiev, who I really admire and like, perhaps got a little irritated in the end and raised her voice to ask us why we only think about money while the entire Documenta 13, for example, was made with love! Well, with love and €29 million we might add... but she said that money does not exist, only love. She meant that, essentially, it was not money that made Documenta happen, but love from which in turn, artworks emerged. And the entire big art audience nodded and hummed as a sign of consensus. We answered that we know the situation very well, because we work and produce everything all the time only with love too – and it is exactly this, which exhausts us. Robin Hood offers affective rest in this situation. This affective rest – that the members do not need to put all their abilities and skills and relationships to work, to bond, to create a community etc. – with still a possibility of income, is the core of Robin Hood. Just give your money, we will make it work and give you back more, and you can do what ever you want. You can save your love. We are a love bank. Documenta 13 crystallized it almost perfectly.

Pekka: The profit made by Robin Hood is distributed amongst its members, who have the possibility of either keeping the whole amount or giving a part of it to the common pool of the co-op.

Akseli: That's right.

Pekka: So far, the investments by Robin Hood have been doing well.

Akseli: In this business nothing but the results matter. We have been able to create a start-up that financed itself already during its first year by income funding, that is pretty rare. And during the second year, we multiplied our assets under management tenfold. This is just a beginning; you haven't yet seen anything of what we can really do. We are preparing for some serious kick-ass operations to start taking place.

Pekka: Many newspaper reporters have asked about a proof of existence of the portfolio.

Akseli: This is a very interesting question. How can we be certain that the Robin Hood portfolio exists? How can you be certain of the value of something? Because this is what they are really asking: does Robin Hood really exist, does its portfolio exist, and how can they be certain of that? And then we have provided formal documents, company registry papers, an auditing report of the accounting by Ernst & Young, our portfolio report by Interactive Brokers which is one of the most respected brokerage houses in the world. I don't know what else we could do. I don't know if they are as thorough when they go to a normal bank, what kind of evidence they ask to believe that this or that fund offered by the bank really exists? I wonder how those banks would answer if asked 'do you really exist, does this fund really exist?'

How can we be certain that a portfolio of any investment bank really exists? That it has value? Of what is this value made? You must trust. Think about the Bernie Madoff affair for example, the largest financial fraud in U.S. history, how long he was able to carry on his investment scam, just because he was the ex-chairman of NASDAQ. The big banks spend billions to appear trustworthy and seduce people to trust them. On average banks have 20 to 30 sales people per one analyst. That is their real business. And do you think we should trust them? I mean, after all we know, that they cheat,

con, exploit clients for their own profit, manipulate European level interest rates, the incredible bonus systems. How is trust created? This is the question at core of Robin Hood. Unlike the normal banks and investment houses, we are fully transparent and not afraid of this question. How is value actually made? And this is also why the clergy tries to refuse our entrance to the temple, so that the emperors without clothes will not be revealed.

This is what the priests repeat: you philosophers and artists and temporary workers, you have no access, to the temple, you don't understand, you cannot come here, you cannot touch this, you must let us deal with this. The funniest thing of course is, that Robin Hood has been able to create something that this clergy will not understand. This is also our best protection.

We have the power and imagination to invent the new financial instruments and services that we need.

Pekka: Robin Hood also invests in oil, weapons industry, and other companies that traditionally might be considered to be evil.

Akseli: Yes, we do.

Pekka: What is the ethics of this?

Akseli: We place our tax on all instruments in which we see the financial oligarchy move. It is a shameless ethic, a scandalous ethic, which binds itself directly into politics. It is an ethical order that perhaps goes beyond the Greek and Christian traditions of ethics, a post-ethical ethics and post-political politics that corresponds to our subjectivity and situation.

Robin Hood is not a moralistic organization. It is not an organization of the 'good'. We make no promises of the 'good' around which we would organize. And we are trying to not be an ethical organization either. Production of ethics – of the conditions and environments of our action and thought, of the habits and rules that we follow as our 'second nature' as Aristotle put it – has become an important method to exhaust the potentiality of our action. We are trying to break out of this form of control. Our ethics are about reopening the field of the possible.

So Robin Hood ethics are about being able to take action upon oneself and others. An ethical subject is a subject that is capable of taking risks, posing a challenge, introducing conflict and division into community, and of governing oneself and others in a situation of conflict. Our ethics have to do much more with combat and politics, than with being nice and responsible, doing what is accepted, staying in a place assigned to you. The ethics of Robin Hood do not include such aspects. It is an ethics closer to a poetic notion, as our philosopher friend Juha Varto has beautifully said.

A poetic stance takes place in active doing, being in operation, not stopping to reflect. It is a warrior's stance that has no individual or personal or collective message to fight for but a profession of a simple existential pragmatic that gives meaning to all there is to do. Poetic stance is an ethic-free, moral-free territory where experimentation is

the only guiding principle. Anything may be expected from us. There is no criterion for good or bad since there is no solid context to which such an evaluation could refer.

Today poetic stances belongs to people who are active without a cause and without a need to legitimize their every step in order to be able to take the next one. It includes the idea that steps cannot be separated if one is in the middle of what is happening, just like the motion in Zeno's paradox, where the arrow is motionless at every separate point of its trajectory and seems to annul the reality of motion and change for anyone ends up in communication and the power of meaningful language ridiculed by the sophist. Poetic means being in the middle, it leads towards a change, a region, which is not controlled by, determined space and time. This is where ethics begins. Ethics is a question about the possibility of the future.

Pekka: Does it mean that Robin Hood is trying to beat the enemy by joining them?

Akseli: We are trying to find a way forward from the financialization of economy. There is no way for some kind of return; our money is already there. Every time you use your credit card you take part in the creation of finance. As soon as your money hits your account, the banks start to use it for expanding credit. Your retirement money is working day and night at the market. And money does not obey boundaries like 'good' and 'bad', you cannot tell it to stay in one place, like in the stock of a 'nice company' and not to go somewhere else. Money does not function like that. There are no financial virgins.

And even more importantly, our individual and collective capability to assume debt and pay taxes is the main raw material for the accumulation of financial assets at the moment; it is the base for the continuous supply of safe collateral for capital that allows riskier credit, like derivatives, to be priced. The size of the derivative market has grown in the past 30 years to become over 20 times bigger than entire world Gross National Product. And at the same time the number of banks has decreased by 40%. Only nine big investment banks actually control almost the entire derivative market. This has nothing to do with free competition or 'may the best win'. During the first three months of 2014 alone the net earnings of Goldman Sachs was over 2.02 billion dollars, HSBC 5.1 billion dollars, JP Morgan 5.3 billion dollars in three months! It is quite a lucrative business. And our money, for example in retirement funds, is there too. We never see the profits. We just carry the risks. Our individual and collective capability to assume debt, pay taxes and bear the austerity measures is used directly as raw material for making these profits. We are the wild side of finance.

INCULCATING ETHICAL BEHAVIOUR IN MARKET TRANSACTIONS? THE CASE OF THE SHARIA ONLINE TRADING SYSTEM IN INDONESIA

LENA RETHEL
AND IRWAN ABDALLOH

INCULCATING ETHICAL BEHAVIOUR IN MARKET TRANSACTIONS? THE CASE OF THE SHARIA ONLINE TRADING SYSTEM IN INDONESIA

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In the wake of the global financial crisis of 2007-9,¹ the search is on for finding alternatives to a global financial system whose flaws have been thoroughly exposed, both in terms of its proneness to crisis and its highly uneven – if not unjust – economic and social impact. Commentators have identified a whole plethora of financial products – an alphabet soup of CDOs, CDS, etc. – as highly implicated in the crisis and coined terms such as ‘toxic assets’ and ‘financial weapons of mass destruction’ for these products. Islamic finance is one of the alternatives that has been put forward in post-crisis debates. It is a fast expanding segment of international financial markets with annual growth rates estimated to range from 15 to 20 percent. Deriving its core principles from the jurisprudential body of knowledge known as the Sharia, Islamic finance has distinct notions about debt, creditworthiness and the relationship between the ‘financial’ and the ‘real’ economy. Its advocates suggest that Islamic finance draws on religious values to promote a (more) ethical approach to finance that is at the same time transaction-friendly. It joins the ranks of other investment approaches proclaimed to be ‘more ethical’ such as socially responsible finance, green financing or financing for development. However, unlike other proposals for a more ethical finance, Islamic finance clearly sees the transaction element of finance within its ethical remit. The Sharia Online Trading System promoted by the Indonesia Stock Exchange and discussed here is a case in point.

Islamic Finance, Markets and Ethics

The global financial crisis of 2007-9 once more brought the questionable ethics of international financial markets to the fore. Pundits variously traced the causes of the crisis back to ‘a giant ponzi scheme’, high street banks losing ‘their moral compass’ or the ‘flexible ethics’ of investment bankers. As a whole, the financial services industry – despite being in many countries one of the most heavily regulated business sectors – struggles to come to terms with persistent problems of conflicts of interest,

1. While it is notoriously difficult to pin down the exact time frame of the global financial crisis (and the term global might be a misnomer given that it was the transatlantic financial systems that were at its core), problems in the U.S. credit market that emerged in late 2006 led to tighter liquidity that resulted amongst other things in the bank run on U.K.-based Northern Rock in 2007, the first run on a British bank in over a century. The period from 2007-2009 was characterised by a global liquidity crunch and recession in the U.S.. This is not to say that the crisis is truly over yet. In 2009 it morphed into a crisis of sovereign debt in Europe and its repercussions are still felt today.

often to the disadvantage of smaller, less sophisticated (too often that is less well connected) market participants.² Yet, despite questions of ethics going to the heart of financial market practice, precisely such questions are often side-lined in economic analyses. Indeed, as the study of economic social relations and dynamics has moved from the Moral Economy approaches of the 18th century (think Adam Smith) to the Political Economy approaches of the 19th century (think David Ricardo) and then on to the 20th century disciplinary subject of Economics (think post-marginal revolution), markets have increasingly become conceptualised as *ethics free zones*, subject only to the coordinating function of the price mechanism, somehow arrived at through the intersection of demand and supply.³

In so doing, the always-embeddedness of markets – including those for capital – in social, cultural and even gendered relations is erased.⁴ Rather than being reflective of the social reality of markets, this is very much an analytical (and often political) choice. Nevertheless, contesting the absence (of an explicit articulation) of the ethical and social dimensions of financial markets is a key theme pervading the more critically inclined political economy and social studies of finance literatures. Here, financial markets are not conceptualized as natural phenomena – that is abstract rational entities that follow objective, scientific principles – but as the result of historical contingencies, political contestation and the emergence of shared understandings which condition, and are conditioned by, financial practices.⁵ Its explicit claims to constitute a (more) ethical approach to finance, makes Islamic finance an interesting test case to explore.

The advent of fully-fledged interest-based financial systems played a significant role in the emergence and expansion of the modern economy. In so doing, the acceptance of receiving and paying interest as legitimate economic practice was part of the transformation of European social epistemologies in the transition from medieval economic and political systems to modernity.⁶ Like medieval Christian economic thought, Islamic finance forbids interest. Nevertheless, in its current guise Islamic finance is a distinctively modern phenomenon. Local Islamic savings schemes emerged in a number of former British colonies after independence in the 1950s and 1960s.⁷ Private Islamic banks were established in the Middle East following the increase in oil prices in the early 1970s.⁸ Other parts of the world followed swiftly. As a consequence, over the last thirty years, Islamic finance has made considerable inroads in both Muslim and non-Muslim societies. It has spread to more than 75 countries and – by current estimates – has achieved

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2. See, Guido Palazzo and Lena Rethel, 'Conflicts of interest in financial intermediation', *Journal of Business Ethics* 81.1(2008): 193-207.
 3. See Matthew Watson, 'What Makes a Market Economy? Schumpeter, Smith and Walras on the Coordination Problem' in: *New Political Economy* 10.2 (2005): 143-161.
 4. For a critique, see James Brassett and Lena Rethel, 'Sexy Money: The Hetero-Normative Politics of Global Finance', *Review of International Studies*, forthcoming in 2015.
 5. See Lena Rethel, 'Whose Legitimacy? Islamic Finance and the Global Financial Order', *Review of International Political Economy* 18.1 (2011): 75-98.
 6. See Amartya K. Sen, *Money and Value: On the Ethics and Economics of Finance* [Denaro e Valore: Etica ed Economia della Finanza], Rome: Bank of Italy, 1991; Bill Maurer, *Pious Property: Islamic Mortgages in the United States*, New York: Russell Sage Foundation, 2006.
 7. Ibrahim A. Warde, *Islamic Finance in the Global Economy*, Edinburgh: Edinburgh University Press, 2000.
 8. Clement M. Henry and Rodney Wilson (eds) *The Politics of Islamic Finance*, Edinburgh: Edinburgh University Press, 2004.

a global market size of more than 1 trillion U.S. dollars in assets.⁹ Moreover, not only has the number of specialist Islamic financial institutions proliferated, but major international banks such as HSBC and Standard Chartered Bank have launched Islamic subsidiaries.

What are the foundations of Islamic finance's claim to constituting a (more) ethical approach to finance? What constitutes its core principles? To begin, Islamic finance seeks to install a financial order that complies with the religious teachings of the Quran, the Sunnah and the Hadith.¹⁰ Interest – or *riba* (literally: increase; generally interpreted as the paying and receiving of interest) – constitutes what Bill Maurer calls 'the absent center of [Islamic finance] today'.¹¹ The prohibition of *riba* can be found in the Quran. For example, the Surah Al-Baqarah sets out a number of principles with regard to charity and money-lending. Lending is not considered a legitimately profitable activity. According to Islamic financial thought, the prohibition of *riba* precludes conventional borrower-lender relationships in which borrowers are exposed to all sorts of risk, whilst the lender only risks the borrower's default. Islamic finance therefore is thought to exhibit a strong preference for equity finance over debt finance. For example, bank accounts – unless funds are kept with a bank purely for safekeeping purposes – typically take the form of profit and loss sharing accounts, where the account holder enters into a partnership arrangement with the bank. Some scholars argue that banning the risk-free accumulation of capital, and the concentration of wealth in the hands of only a few, is part of Islam's concern for greater economic and social justice. Thus for instance, the 'economic viability and profitability' of a project are crucial determinants of its fundability.¹² Along these lines, Islamic finance also forbids *gharar* (profiting from contractual uncertainty) and *maisir* (gambling). Moreover, certain products and practices such as pork, alcohol or prostitution are deemed *haram* (prohibited). This also extends to their funding. Indeed, in Islamic economic thought the market mechanism is complemented by a 'moral filter' of what is socially desirable.¹³ Thus, Islamic finance bases its claim to being an ethical approach to finance on the *religious values with which it seeks to comply*.

Given these stipulations, what makes Islamic finance distinct as a practice? Prima facie, Islamic finance promotes specific ideas about debt, creditworthiness and the relationship between the financial and the productive economy. Debt – no matter if sovereign, corporate or household – is not a legitimately profitable activity. Creditworthiness is based on the 'worthiness' (in terms of economic profitability but in some interpretations also social desirability) of the project, and not primarily the repayment capacity of the borrower. Islamic finance is asset-oriented in that financial products have to be linked to the 'real' economy, which rules out many of the recent synthetic financial innova-

9. Zeti Akhtar Aziz, 'Internationalisation of Islamic Finance: Bridging Economies', welcoming address by the Governor of the Central Bank of Malaysia at the *Global Islamic Finance Forum 2012*, Kuala Lumpur, 19 September 2012.

10. The Quran is the holy book of Islam, equivalent to the Bible in Christianity, whereas the Hadith is a religious text that contains the utterances of the Prophet Mohammed and the Sunnah recounts the teachings and way of life of the Prophet.

11. Bill Maurer, *Mutual Life, Limited: Islamic Banking, Alternative Currencies, Lateral Reason*, Princeton: Princeton University Press, 2005, p. 39.

12. Saad Al Harran (ed.) *Leading Issues in Islamic Banking and Finance*, Petaling Jaya: Pelanduk Publications 1995, p. xii.

13. Gillian Rice, 'Islamic Ethics and the Implications for Business', *Journal of Business Ethics* 18.4 (1999): 346.

tions that were so heavily implicated in the 2007-9 global financial crisis. In so doing, Islamic finance is thought to embrace the mutually constitutive roles of the financial and the productive dimensions of the economy. Indeed, on this reading the primary purpose of finance is seen as serving the needs of the latter. Thus, the social epistemology from which Islamic finance is built is distinct from that which underpins much of contemporary mainstream finance. Moreover, these features of Islamic finance have to be seen in the wider context of Islamic economic philosophy which contains strong elements of redistribution (notably through zakat, mandatory alms-giving by individuals and firms), the idea of participatory economic growth, and risk-sharing as the basis of a more equitable development, together with a certain materiality or transactions focus as expressed in the sanctity of contracts and property rights already maintained in the Quran. Thus, Islamic finance bases its claim to being an ethical approach to finance on the greater social justice of *the outcomes it intends to achieve*.

At the same time, however, procedural elements play an important role to ensure the compliance of Islamic financial products and services with the principles of the Sharia. In this regard, governance through Sharia boards has emerged as a key mechanism in the Islamic legitimisation of Islamic financial products and services. Models of Sharia governance vary across countries. Typically, Sharia boards operate at the firm level, advising financial institutions on the Sharia compliance of the products they develop. Here, the Sharia board derives its authority from the reputation of the scholars specialised in Islamic jurisprudence who compose it. However, in a number of countries, including Malaysia and Indonesia, there also exist Sharia boards (or advisory councils) at the national level, which hold the ultimate authority in ruling on what is compliant or non-compliant with the principles of the Sharia. This is meant to ensure consistency of Sharia interpretation and to provide market participants with greater certainty. In Indonesia, the Sharia governance of Islamic finance is civil society-centric in that the Sharia board responsible for issuing national fatwas on Islamic finance is located at the Indonesian Council of Ulama (*Dewan Syariah Nasional – Majelis Ulama Indonesia* or DSN-MUI), more specifically its National Sharia Board. DSN-MUI, formed in 1999, has 'responsibility for overseeing doctrinal compliance' of Islamic financial institutions.¹⁴ In many countries, a major challenge is to find Sharia scholars who are not only proficient in Islamic jurisprudence but also have a good understanding of how financial markets work. Thus, Islamic finance bases its claim to being an ethical approach to finance on the *legitimation practices* of Sharia scholars.

Islamic finance combines elements of both deontological and consequentialist ethics.¹⁵ It does so on the grounds of both the specific Sharia principles by which it abides, but also because of its commitment to a financial order of greater social justice, based on the general principles of equity, mutuality and sustainability, and its emphasis on the social embeddedness of financial activity. In short, the claim of Islamic finance to constituting an ethical approach to finance rests both on the religious values that it embodies, the socio-economic outcomes that it seeks to achieve, and the legitimisation practices in particular of Sharia scholars. Nevertheless, rather than presenting a uni-

14. Tim Lindsey, 'Between Piety and Prudence: State Syariah and the Regulation of Islamic Banking in Indonesia', *Sydney Law Review* 34 (2012): 119.

15. See Sen 1991 for a similar argument applied to Judeo-Christian finance.

fied alternative to mainstream financial practice, Islamic finance exhibits great variation both in the ways in which it is understood and enacted, but also reacted to. Islamic finance is a product of ongoing negotiation of the social world of finance and political contestation of its value systems. Indeed, this is not just about how Islamic finance and its conventional counterpart have been framed in various professional, popular and media discourses before and after the global financial crisis.¹⁶ It goes to the very heart of a financial reality that only acquires meaning through the practices to which it gives rise and the ways in which it is acted upon.

With regard to capital market finance specifically, attention has mainly focused on developing new products that are Sharia-compliant and filter out those that breach the principles of the Sharia. Interest-based financial instruments such as conventional bonds are not acceptable. Nevertheless, with *sukuk* Islamic finance promotes a class of Sharia-compliant financial products that fulfil very similar functions. Sukuk are typically structured in the form of claims on assets that generate an income stream, such as land/rental income or leased assets, whilst not being interest-based. In sharing profits and losses, equity finance is by nature participatory and thus less controversial from an Islamic perspective. Here, the focus very much lies on developing screening technologies to filter out stocks that are not Sharia-compliant, be it because a company engages in haram activities (e.g. breweries producing and selling alcohol, arms manufacturers producing and selling weapons etc.) or because it finances itself through debt and thus engages in *riba* and fails to meet financial ratios. Indeed, whereas Islamic finance scholarship has paid considerable attention to the Sharia-compliance (or not) of a growing range of Islamic financial product structures and capital flows, less attention has been paid to the important other component of what 'makes' financial markets – the transaction element.¹⁷

Transactional Ethics at the Indonesia Stock Exchange

With a population of about 250 million people, roughly 87 percent of which are Muslim, Indonesia is the country with the biggest Muslim population in the world. This marks the emergence of Islamic finance in Indonesia as an important development not just with regard to its national implications but also its potentially wider global significance. Nevertheless, Indonesia is still at a relatively early stage of financial development – around 60 percent of the population are classified as unbanked (i.e. without access to a bank account). The first Islamic bank in Indonesia – Bank Muamalat – was created in 1991 and began its operations in 1992. It pursued a model of interest-free banking. The development of Islamic banking in Indonesia accelerated in the wake of the Asian financial crisis of 1997-8.¹⁸ With regard to the development of the Islamic capital market (ICM) specifically, its beginnings can be traced back to 1997, which saw the release of the first Islamic mutual funds. In 2000, the Jakarta Islamic Index (JII) was launched, containing the 30 most liquid Islamic stocks. However, its impact on the development

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16. See G. Thompson, 'What's in the Frame? How the Financial Crisis is Being Packaged for Consumption', *Economy and Society* 38.3 (2009): 520-524; and L. Rethel, 'The Imaginary Landscapes of Islamic Finance', chapter prepared for J. Pollard and R. Martin (eds) *Handbook of the Geographies of Money and Finance*, Cheltenham: Edward Elgar, 2016.
 17. Compare Mitchell Y. Abolafia, *Making Markets: Opportunism and Restraint on Wall Street*, Boston: Harvard University Press, 1996.
 18. Umar Juoro, 'The Development of Islamic Banking in the Post-Crisis Indonesian Economy', in G. Fealy and S. White (eds) *Expressing Islam: Religious Life and Politics in Indonesia*, Singapore: ISEAS, 2008, pp. 229-250.

of the Islamic capital market in Indonesia was marginal. Market participants hardly recognized that the capital market of Indonesia had an Islamic stock index as indicator of Islamic capital market performance.

While the Islamic capital market in Indonesia is not a 'stand-alone' market, but an integral part of the country's capital markets and in principle uses the same underwriting and trading mechanisms as the conventional segment, both products and transactions have to comply with the stipulations of the Sharia.¹⁹ DSN-MUI issued its first capital market fatwa – on investment in Islamic mutual funds – in 2001.²⁰ This was followed by a number of fatwas on the product structures deemed permissible in the Indonesian Islamic capital market.²¹ Along these lines, the early 2000s also saw the launch of the first sukuk in the Indonesian capital market, again with limited impact for the growth of Islamic capital markets. In the mid-2000s the Securities Exchange Commission Bapepam-LK (now submerged within the 2013 established Financial Services Authority or OJK) issued a number of regulations to promote the development of capital markets both in terms of market share and number of investors, but growth remained slow.

Indeed, the development of the Islamic capital market in Indonesia only gained momentum from 2011 onwards, which saw a number of landmark developments aimed at: 1) increasing the visibility of the Islamic capital market segment, 2) strengthening in particular its Sharia governance and 3) raising awareness of Islamic capital market finance. Firstly, IDX launched the Indonesia Sharia Stock Index (ISSI) in May 2011.²² As a consequence, there are now two Islamic stock indices in the Islamic capital market of Indonesia: if the JII consists of the 30 most liquid Islamic stocks, then the constituents of ISSI are the entire universe of Islamic stocks listed on the Indonesia Stock Exchange (IDX). The existence of ISSI had a positive impact on the development of the Islamic capital market in Indonesia because it provided more options for investors and investment managers wanting to invest in or manage Islamic stock portfolios. It can also serve as a performance benchmark. The data shows that the market responded positively to the presence of ISSI. The importance of Islamic mutual funds as a popular product for investing in Islamic stocks increased significantly, both in terms of number of funds and assets under management. In the five years prior to the launch of ISSI, the average of new issuance was only five Islamic mutual funds per year, but after that the average of new issuances was fourteen per year. As of end of October 2013, the market capitalization of the Islamic capital market segment had reached IDR 2.618 trillion, approximating 60 percent of the total market capitalization of IDX valued at IDR 4.485 trillion.²³

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19. See Miranti Kartika Dewi and Irwan Abdalloh, 'Socializing Islamic Capital Market Products through Public Education Events: The Case of Indonesia', Middle East Institute, 20 February 2013.
 20. Fatwa No. 20/DSN-MUI/IX/2001 concerning 'Guidelines for the Implementation of Investment for Sharia Mutual Funds'.
 21. The fatwas issued by DSN-MUI to date can be accessed at <http://www.dsnmui.or.id/index.php?page=fatwa>. At the time of writing, Indonesia had fourteen fatwas issued by DSN-MUI specifically related to the Islamic capital market.
 22. In 2007, the Jakarta Stock Exchange merged with the Surabaya Stock Exchange to create the Indonesia Stock Exchange (IDX).
 23. See IDX press release, 2 November 2013, <http://www.idx.co.id/Beranda/BeritadanPengumuman/SiaranPers/ReadPressRelease/tabid/191/ItemID/d72739a7-a3cb-482f-8b2d-040c7ab0d4e8/language/id-ID/Default.aspx>.

Secondly, the revival of the Islamic capital market in Indonesia was marked by the launch of a new fatwa on the Sharia-compliance of equity trading mechanisms (in the following: Fatwa No. 80) in 2011.²⁴ This was the first DSN-MUI fatwa to be published simultaneously in Arabic, English, and Indonesian. The main objective of Fatwa No. 80 was to increase the confidence of investors who want to invest in Islamic stocks in Indonesia's capital market. Research showed that people who want to invest in an Islamic way still worried about the compliance of products and trading mechanisms in the Islamic capital market of Indonesia with the Sharia. Although DSN-MUI had launched a number of fatwas which related to Islamic capital market products, including the types of *akad* (agreement) which could be used to structure products, it was thought that the public still needed to be convinced that capital market transactions themselves were compliant with Sharia principles. Therefore, IDX in collaboration with DSN-MUI launched Fatwa No. 80. Unlike previous capital market fatwas issued by DSN-MUI, where almost the entire fatwa was focused on regulating Islamic capital market products and related *akad*, Fatwa No. 80 regulates how to conduct transactions in accordance with Sharia principles. In order to be categorized as a Sharia-compliant investment, according to the fatwa, two conditions must be met: only Islamic (i.e. Sharia-compliant) stock can be traded (thus e.g. excluding stocks of breweries or conventional banks) and the transaction itself must also comply with the Sharia. Fatwa No. 80 details fourteen transactions that either do not comply with the principles of the Sharia or are outright prohibited by the Sharia. These include margin trading (interest-based transactions), short selling (*bai' al ma'dum*) and cornering (*ikhtikar*). In so doing, Fatwa No. 80 takes a stand against speculative practices in financial markets.

Thirdly, greater efforts were undertaken to raise awareness of Islamic capital market finance among financial market practitioners, but also journalists and the public at large. IDX in particular began to conduct regular one-day training sessions on the Islamic capital market (Islamic Capital Market Schools or *Sekolah Pasar Modal Syariah*). These are held at the IDX office in the Sudirman Central Business District, Jakarta's main financial district. The syllabus includes an overview of the Indonesian capital market in general, of Sharia principles and of the Islamic capital market specifically. According to a survey IDX conducted among past participants, it appears that the characteristics of Sharia-based investors are relatively similar. They are more concerned with Sharia-compliance than purely capital gain or return on investment. If they are convinced that investing in the stock market is Sharia-compliant then they would be investors, even if the advantages of the investment may be relatively less compared to other investment return. Therefore, the approach taken to draw them into the capital market is relatively different from the conventional approach. They are classified as new investors in the stock market, previously not willing to invest in the stock market as they saw it as gambling and therefore prohibited by the Sharia. However, after being given the proper education about investing in the stock market and the issuance of Fatwa No. 80, they became convinced that investing in the stock market can be Sharia-compliant.

In combination, the launch of ISSI, together with the issuance of Fatwa No. 80 and intense efforts to educate both financial market practitioners and the public at large

24. See Fatwa No. 80/DSN-MUI/III/2011 concerning 'The Implementation of Sharia Principles in the Equity Trading Mechanism at the Stock Exchanges Regular Market'.

about Islamic finance has advanced the development of the Islamic capital market in Indonesia. In particular, the public understanding of the Islamic capital market increased significantly as particular surveys with past participants of training seminars indicate and led to growing interest in investing in Islamic stocks. However, there remained a disconnect between the high public interest in Sharia-based investment and a lack of understanding of the mechanisms of Sharia-compliant transactions. It was deemed that there was a need to create a system to accommodate the condition and to assist investors when investing in Islamic stocks in meeting the criteria of Sharia-compliant transactions detailed in Fatwa No. 80.

In response, IDX came up with a system of Sharia-compliant transactions, the so-called Sharia Online Trading System. SOTS was developed in the second half of 2011 and began its use as a pilot project at the end of 2011. SOTS gives practical definition to Fatwa No. 80 as a tool for transacting Islamic stock in the Indonesian Islamic capital market. The SOTS business model was created by IDX, but the actual systems are developed by securities companies (brokers) which are exchange members. They are then reviewed by DSN-MUI, which certifies their Sharia compliance subject to them meeting all criteria and complying with Fatwa No. 80. The Indonesia Stock Exchange (IDX) acts as a technical assistant for exchange members (brokers) that develop SOTS. The purpose of this assistance is to ensure that the development of SOTS complies with Fatwa No. 80.

Exchange members that develop SOTS must have online trading systems that comply with the Exchange's criteria because it is an online-based system for transacting Islamic stocks. As a mechanism for Islamic-based transactions, SOTS must fulfil the main requirements of Islamic compliance as governed by Fatwa No. 80 as follows:

1. Only Islamic stocks can be traded. SOTS will block any transaction of stock that does not comply with the Sharia. Blocking is started from the first step of the transaction – that is when investors input a buying order of stocks.
2. It must be a cash-basis transaction for buying Islamic stocks. Therefore, SOTS must clearly separate between cash in the Investor Account and Islamic stocks in the Securities Account. From an Islamic finance point of view, both have different definitions and functions. Therefore, SOTS does not recognise the existence of the net position between stocks and cash of investor transactions in the same day. The consequence of this concept is that exchange members (brokers) cannot execute a force-selling transaction of the investor portfolio.
3. Margin trading (investor borrows money from broker to purchase stocks) is prohibited because it is categorized as a *riba*-based transaction.
4. Short selling (investor sells stocks that is not owned by the seller) is prohibited because it is categorized as *bai' al ma'dum*.²⁵

If a transaction is entered in SOTS that is in breach of Sharia principles, a window pops up that tells how the transaction violates Fatwa No. 80 (see Figures 1 and 2 for examples of margin trading and short selling). While other stock exchanges such as

25. Note that in the conventional market segment, IDX applies a policy of regulated short selling, which is a permitted market transaction, although only for certain shares. On the last trading day of every month, IDX announces the list of shares permitted for margin trading and short selling. See World Exchanges, 'Indonesia Stock Exchange' (no date).

the Islamic segment of Bursa Malaysia also prevent activities such as short-selling, to the best of our knowledge IDX SOTS is unique in that it is not only directly derived from a fatwa, but also in that it very clearly has an educational objective; it does not just prevent prohibited transactions but highlights which Sharia principles are violated and thus seeks to inculcate greater awareness of Sharia principles.



Fig. 1: Screenshot of Prohibited Margin Trading. This transaction violates specific provision 3h of Fatwa No. 80: Actions included in riba category.



Fig. 2: Screenshot of Prohibited Short Selling. This transaction violates specific provision 3h of Fatwa No. 80: Actions included in bai' as-ma'dum category.

The inculcation of ethical behaviour in market transactions through Fatwa No. 80 and SOTS is the result of a process of *double translation*. In a first step, it entails the translation of financial market behavior that is deemed unethical into a language understood by Sharia scholars, who are proficient in the deliberation and application of Sharia principles, but who are not necessarily experts on financial markets. In a second step, Sharia principles specifically in regard to these types of behavior are then translated into computer-based trading systems to prevent prohibited transactions and produce the pop-up screens intended not only to influence the behavior of market participants but also to educate them in the principles of the Sharia. At the Indonesia Stock Exchange, ethical behavior in market transactions is sought to be enacted through a combination of concrete market practices developed in dialogue with the interpretation and deliberation of more abstract religious norms.

Currently, there are eight exchange members that have developed SOTS in the Islamic capital market of Indonesia. In terms of numbers, this is still a small fraction if compared to the total number of exchange members in Indonesia that have implemented online trading systems. However, the existence of SOTS in the Islamic capital market of Indonesia has driven significant growth in terms of the numbers of Islamic investors. According to IDX data, the number of investors investing in a Sharia-compliant way in 2013 increased by 51 percent compared to the previous year. In addition, all indicators of Islamic stock trading performance, such as market capitalization, frequency, and number of Islamic stocks showed a significant market share of over 50 percent. Thus, as the one and only Islamic stock trading system in the world, SOTS has successfully accelerated the growth of the Islamic capital market in Indonesia, especially with regard to Sharia-compliant stocks and the trading in them. This is deemed to be very much in the spirit of Islamic finance – developing mechanisms that comply with the principles of the Sharia that are at the same time transaction-friendly and here particularly intended to promote the growth not just of the Islamic capital market segment, but the Indonesian capital market as a whole.

Islamic Finance: Mainstream/Alternative?

Advocates of Islamic finance see their claims for a more ethical financial system vindicated by the fallout from the global financial crisis of 2007-9. The crisis itself served as an accelerator of the expansion of Islamic finance in terms of product innovation, standardization of practices and geographical coverage. Indeed, just at the time of writing, we see countries from across the globe intensifying their engagement with Islamic finance – just witness the debut issuance of sovereign sukuk by non-Muslim majority countries as diversely situated as the U.K., South Africa and Hong Kong. Both in its scale and in terms of the space it occupies, Islamic finance is certainly very different from some of the financial experiments discussed in this volume. It is promoted by states, practiced by mainstream financial institutions and makes use of the same platforms and knowledge infrastructures as conventional finance. So has Islamic finance then become part of the mainstream, increasingly detached from the ethical/religious values which it supposedly purports?

The development of the Islamic capital market at the nexus of ethical principles and market growth is not unambiguous – especially so as ultimately the greater availability of Sharia-compliant investment options is intended to draw more actors into the market, foreclosing the possibility of non-market based financial alternatives. At the same

time, Islamic finance constitutes an inherently reflexive approach to finance.²⁶ This is not just about passing finance through a moral filter, or layering religious values on top of financial practice as usual. It goes to the heart of practical economic reasoning and in so doing opens up new possibilities for *doing finance differently*. The example of the Sharia Online Trading System discussed here is a case in point.

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26. See in particular Bill Maurer, 'Resocializing Finance? Or Dressing it in Mufti? Calculating Alternatives for Cultural Economies', *Journal of Cultural Economy* 1.1 (2008): 65-78.

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BITCOIN AS POLITICS: DISTRIBUTED RIGHT-WING EXTREMISM

DAVID GOLUMBIA

BITCOIN AS POLITICS: DISTRIBUTED RIGHT-WING EXTREMISM

DAVID GOLUMBIA

Theorists of science and technology have long insisted that their objects of study can and should often be construed as profoundly implicated in, and at least in part constituted by, the social systems out of which they have been produced and in which they are embedded. Frequently this perspective is hard to reconcile with what look to be obvious facts of common sense: jet rockets really do enable space travel, lasers really do read and write to digital media discs, transistors really do enable miniaturized digital devices, and so on; so what point is there to declaring that these objects ‘are’ social or political, as if somehow social or political will might have altered or prevented the objects from coming into being, or enabled space travel or miniature digital devices without the relevant technological underpinning? Yet it is hard to deny that political and social contexts play significant roles in the adoption and proliferation of technical devices and methods, and the line between these roles and the literal construction and operation of technologies is at best blurry.

In his famous 1980 essay ‘Do Artifacts Have Politics?’ technology scholar Langdon Winner asked us to consider whether a ‘given device might have been designed and built in such a way that it produces a set of consequences logically and temporally prior to any of its professed uses.’¹ For some technologies and in some contexts, this kind of dynamic can be hard to see, and the apparently common-sense insistence that technologies develop autonomously, as it were, continually urges us to reject the idea that technologies might be in part or even largely social constructions. This is the case even when the technologies themselves, as we see in so much promotion of computational devices and methods today, are advertised as having socially beneficial effects. Technologies are neutral, this view seems to suggest, when human beings use them for ends we (whoever ‘we’ are) don’t like; they are socially embedded and the result of democratic or social power (as determined, almost exclusively, by markets or market-like aggregations) when they are used for ‘good’ purposes (again, *pace* the fact that what appears good from one point of view may appear not at all good from another). In many ways, the very effectiveness of technologies is used as self-justifying evidence against the view that technologies might be deeply political, especially when the politics in question might be ones ‘we’ oppose.

Bitcoin (along with the other distributed ledger cryptocurrencies of which it is the best-known and most widely-used exponent) provides us with an unusually pointed example of the relationship between the social and the technical; for unlike many

1. Langdon Winner, ‘Do Artifacts Have Politics?’, *Daedalus* 109:1 (Winter, 1980): 125.

technologies critiqued by scholars, Bitcoin is not a technology that fails, either altogether due to errant premises (e.g. cold fusion) or, in part, due to social pressures (e.g. the Betamax videocassette format). Bitcoin is a technology that *works* – that is hard to doubt. Furthermore, it is widespread and being adopted at a furious pace. Yet despite all that, Bitcoin *does not work* – at least not as its advocates suggest it does. Bitcoin absolutely does *something*, yet it does not do what many of its advocates claim it does. Bitcoin is a technology whose social and political functions far outstrip its technical ones. In this sense, Bitcoin can be seen as a technical object that is structured to an unusual extent by politics. Pushing this even further, there are salient perspectives from which Bitcoin appears to be *mostly* a realization of these political concerns: that is, whatever the software itself does, what ‘Bitcoin’ as a cultural object does is to promote a politics that is visible only if one knows where to look. In this sense, we can argue that Bitcoin is politics masquerading as technology, or technology soliciting and promoting a very specific politics, one that despite its public prominence has trouble penetrating fully into some of the social spaces into which Bitcoin provides an important entrée.

Bitcoin is promoted as an alternative form of currency, and even at times as an alternative form of money, but neither Bitcoin’s development nor its promulgation emerges from thoughtful analyses of money or currency as these currently exist, let alone the thought and history that have figured in their development. The grounding problems that Bitcoin advocates consider central are not the ones that major thinkers about money or currency, from the right or the left, have deemed important. On the contrary, those grounding problems are to a lesser degree problems endemic to current technological infrastructure (particularly the ‘double spending problem’, or the ease of counterfeiting digital transactions) and to a greater degree ideological: the desire to bypass the (apparently lawful) credit card and PayPal ‘blockade’ of WikiLeaks, on the one hand (usually mentioned as the instigating event in the widespread use of Bitcoin), and the desire to bypass central and/or commercial banks for either the creation of money (as many of the more rabid advocates insist) or the provision of financial services (the main interest of Satoshi Nakamoto’s original Bitcoin paper), on the other.² The former ideas emerge from a specifically right-wing, libertarian, anti-government politics familiar from much of the WikiLeaks story. The latter ideas emerge from the profoundly ideological and overtly conspiratorial anti-Central Bank rhetoric propagated by the extremist right in the U.S. from as far back as the Liberty Lobby and the John Birch Society, and which despite its overt ‘anti-bank’ rhetoric, on most thoughtful analysis, serves rather than resists the interests of banks and big finance (despite its anti-bank rhetoric, Bitcoin itself is now promoted by banks, investors, and venture capitalists).³ Like many aspects of contemporary political

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2. The original paper is Satoshi Nakamoto, ‘Bitcoin: A Peer-to-Peer Electronic Cash System’, 2008, <http://bitcoin.org/bitcoin.pdf>. On the adoption of Bitcoin in the wake of the so-called ‘blockade’ against WikiLeaks, see Jon Matonis, ‘WikiLeaks Bypasses Financial Blockade with Bitcoin’, *Forbes*, 20 August 2012, <http://www.forbes.com/sites/jonmatonis/2012/08/20/wikileaks-bypasses-financial-blockade-with-bitcoin/>. On the double-spending problem see Jaap-Henk Hoepman, ‘Distributed Double Spending Prevention’, arXiv (2008), arXiv:0802.0832.
 3. For the Liberty Lobby, the John Birch Society, and their connection to contemporary far-right U.S. politics, see Chip Berlet and Matthew N. Lyons, *Right-Wing Populism in America: Too Close for Comfort*, New York: Guilford Press, 2000, especially chapter 9.

discourse, especially as it is evinced on the right, these formations work to keep power concentrated, and their main goal is to steer the masses of disenfranchised voters toward supporting candidates (in particular) and policies (to a lesser extent) that, on most reasonable accounts, actually work against their own class and even individual interests – the most famous example being the emblematic U.S. Tea Party protestors holding signs declaring some variant on the expression ‘Government: Keep Your Hands Off My Medicaid’.⁴

Scholars of money like Mary Mellor and Ann Pettifor have suggested meaningful alternatives to the current money system, but Bitcoin has very little in common with their analyses or their positive proposals, which would require societal and political assent as well as technical innovation.⁵ The lack of any valid, non-conspiratorial analysis of our existing financial systems means that Bitcoin fails to embody any substantial alternative to them. The reasons for this have little to do with technology and everything to do with the financial systems in which Bitcoin and all other cryptocurrencies are embedded, systems that instantiate the forms of social power that cannot be eliminated through either wishful thinking or technical or even political evasion: the rich and powerful will not become poor and powerless simply because some people decide to operate alternate exchange economies. Lacking a robust account of transforming these systems of power, even without Bitcoin’s flaws, a ‘perfect’ cryptocurrency would exacerbate, rather than address, the existing serious problems with our monetary and financial systems. Because it operates without such an account, Bitcoin’s real utility and purpose (and that of the cryptocurrency movement in general) can be better understood as a ‘program’ for recruiting uninformed citizens into a neoliberal and (nominally) anti-government political discourse, understanding the nature and effects of which requires just the attention to political theory and history that Bitcoin enthusiasts rail against.

Its advocates tell us to focus on the way that Bitcoin’s intricate and original technology promises to solve urgent political problems. But it is not Bitcoin’s technology that fails to live up to these promises. Rather, the flaws lie in the diagnosis itself. Like many of the most influential ideas associated with what I and other scholars have called *cyberlibertarianism*, enthusiasts demand we understand Bitcoin as a welcome political intervention, but when pressed for details about that political intervention, its advo-

4. See e.g., Bob Cesca, ‘Keep Your Goddamn Government Hands Off My Medicare’, *Huffington Post*, 5 September 2009, http://www.huffingtonpost.com/bob-cesca/get-your-goddamn-government_b_252326.html.

5. See Frances Hutchinson, Mary Mellor, and Wendy Olsen, *The Politics of Money: Towards Sustainability and Economic Democracy*, London and Sterling, VA: Pluto Press, 2002; Mary Mellor, *The Future of Money: From Financial Crisis to Public Resource*, London and Sterling, VA: Pluto Press, 2010; and Ann Pettifor, *Just Money: How Society Can Break the Despotic Power of Finance*, Margate, Kent: Commonwealth Publishing, 2014. For a specific experimental currency that does attempt to address structural economic issues that is not based in a conspiratorial view of finance, see the Commercial Credit Circuit (C3) currency being tested in Uruguay and Brazil. C3 has been developed principally by Bernard Lietaer, see Bernard Lietaer, ‘Commercial Credit Circuit: A Financial Innovation to Structurally Address Unemployment’, *Lietaer.com*, 30 January 2010, <http://www.lietaer.com/2010/01/commercial-credit-circuit-a-financial-innovation-2008/>, and Bernard Lietaer and Jacqui Dunne, *Rethinking Money: How New Currencies Turn Scarcity into Prosperity*, San Francisco, CA: Berrett-Koehler Publishers, 2013.

cates unfailingly turn back to technical and engineering matters.⁶ In Bitcoin's case this is especially notable, because the *financial* matters Bitcoin is said to 'fix' are complex, technical, and hard even for experts to understand; Bitcoin advocates routinely reject this complexity and argue that well-regarded economists do not know what they are talking about.⁷

The word 'coin' in the name Bitcoin tends to imply *money*, and many talk about Bitcoin as if it were money, but more sober advocates who are a little more familiar with money talk about it almost exclusively as a *currency*.⁸ Money and currency are not the same thing. 'Money', as we use the word today and as economists define it, has three attributes: it is a medium of exchange, a store of value, and a measure of value.⁹ 'Currency' refers to the medium-of-exchange function, but it is well known that almost *anything* can serve as a medium of exchange. The store and measure of value functions require state (or other overarching institutional) authorization and, historically, have required state interventions to ensure stability – functions that Bitcoin cannot force nations to relinquish. It is very basic economics that 'store of value' and 'medium of exchange' are not the same thing, yet reading Bitcoin materials it often seems as if its advocates refuse to acknowledge they are different.¹⁰

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6. For cyberlibertarianism, see, in particular, Richard Barbrook and Andy Cameron, 'The Californian Ideology', *Science as Culture* 6:1 (January, 1996): 44-72, and Langdon Winner, 'Cyberlibertarian Myths and the Prospects for Community', *ACM SIGCAS Computers and Society* 27:3 (September, 1999): 14-19. I have recently tried to adapt these analyses with an eye toward developments since these classic works were written; see David Golumbia, 'Cyberlibertarians' Digital Deletion of the Left', *Jacobin*, 4 December 2013, <https://www.jacobinmag.com/2013/12/cyberlibertarians-digital-deletion-of-the-left/>; and David Golumbia, 'Cyberlibertarianism: The Extremist Foundations of "Digital Freedom"', talk delivered at Clemson University, 5 September 2013, text posted at uncomputing.org, <http://www.uncomputing.org/?p=276>.
 7. See Paul Krugman, 'Bitcoin Is Evil', *The New York Times*, 28 December 2013, and the comments on the article, as well as responses to this piece such as Mark Gongloff, 'Paul Krugman Trolls Bitcoin Fans. Guess What Happens Next', *Huffington Post*, 30 December 2013, Keith Weiner, 'Paul Krugman Is Wrong: Bitcoin Isn't Evil, But Monetary "Stimulus" Is', *Forbes*, 30 December 2013, and Jay Yarrow, 'Tech People Are Passing Around this Paul Krugman Quote on the Internet After He Called Bitcoin "Evil"', *Business Insider*, 30 December 2013. Notably for understanding the political context of Bitcoin enthusiasm, a similar story appeared on the far-right *Infowars* site run by the extremist demagogue Alex Jones: see Nick Sorrentino, 'Paul Krugman Is Scared. He Says "Bitcoin Is Evil". Undermines Central Banks', *Infowars.com*, 29 December 2013, <http://www.infowars.com/paul-krugman-is-scared-he-says-bitcoin-is-evil-undermines-central-banks/>.
 8. See Marc Andreessen, co-founder of the Andreessen Horowitz venture capital firm which is one of Silicon Valley's main backers of Bitcoin-related enterprises, in his 'Why Bitcoin Matters', *The New York Times*, 21 January 2014, http://dealbook.nytimes.com/2014/01/21/why-bitcoin-matters/?_php=true&type=blogs&_php=true&type=blogs&r=1.
 9. On Bitcoin's lack of fit with standard economic definitions of money and currency, see David Yermack, 'Is Bitcoin a Real Currency? An Economic Appraisal', *SSRN*, 1 April 2014, http://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2361599; Paul Davidson, 'Is Bitcoin "Money"? The Post-Keynesian View', *Real-World Economics Review Blog*, 27 November 2013, <http://rwer.wordpress.com/2013/11/27/14335/>. Paul Davidson, 'Is Bitcoin "Money"? The Post-Keynesian View', *Real-World Economics Review Blog*, 27 November 2013, Joshua Gans, 'Time for a Little Bitcoin Discussion', *Economist's View*, 25 December 2013, <http://economistsview.typepad.com/economistsview/2013/12/time-for-a-little-bitcoin-discussion.html>.
 10. Yermack, 'Is Bitcoin a Real Currency?', concludes that Bitcoin is neither money nor a currency. For Bitcoin advocates dismissing many widely-shared economic principles without offering substantive arguments against them, see, e.g., Bitcoin wiki, 'Myths', <https://en.bitcoin.it/wiki/Myths>.

'Money' names the instrument in which official transactions in that nation-state are conducted: all other things being equal, U.S. Government bonds have a value in U.S. dollars, and taxes in the U.S. must be paid in dollars. As another economist puts it, 'in post-Keynesian monetary theory money is anything that will settle a legal contractual obligation. And by the civil law of contracts, the government determines what settles a legal monetary contractual obligation'.¹¹ This is the fundamental point, critical to all monetary theory, that Bitcoin advocates seem unable or unwilling to recognize (and admittedly it is what was until now a fairly arcane point of economic theory): the State decides what money *is*, and no assertion otherwise by individuals or groups can change that – only the law can.

The nature of money is highly complex. As the Cambridge sociologist and political scientist Geoffrey Ingham wrote in 2004 in *The Nature of Money*, 'perhaps the greatest paradox is that such a commonplace as money should give rise to so much bewilderment, controversy, and, it must be said, error. It is not well understood'.¹² Ingham reports that Joseph Schumpeter, who has become the patron economist for digital disruption, could not sort out his own ideas about money sufficiently to complete a monograph about it, despite trying for much of his career. Yet Bitcoin supporters continually write as if money is simple, straightforward, that any attempt to delve into its complexities is disinformation propounded by central bankers, and so on – despite themselves being unwilling even to investigate the basic parameters of the thing they claim to have bettered.

The most florid claim of Bitcoin advocates is that Bitcoin poses 'an existential threat to the nation-state', because nation-states supposedly live in fear that their hold on monetary policy via central banks like the Federal Reserve is threatened by the existence of alternatives to money.¹³ One of Bitcoin's most vocal advocates, Jon Matonis, wrote during Bitcoin's first wave of wide publicity in 2012 that 'Bitcoin prevents monetary tyranny' and that 'just as the Second Amendment in the United States, at its core, remains the final right of a free people to prevent their ultimate political repression, a powerful instrument is needed to prevent a corresponding repression – State monetary supremacy'.¹⁴ But as many economists have pointed out, alternatives to national *currencies* abound – from frequent flyer miles to credit card bonus point programs, from grocery-store coupons to high-value goods like fine art, precious metals, and gems – and it is only in this trivial and colloquial sense that Bitcoin is money.¹⁵ None of these alternative currencies pose any threat whatsoever to national sovereignty over money, a fact that Bitcoin advocates seem unable to process. In fact, they make continual reference to the superiority of gold-backed money, despite the fact that governments fixed even the price of gold at many moments in history to tame volatility, and in the

11. Davidson, 'Is Bitcoin "Money"? The Post-Keynesian View'.

12. Geoffrey Ingham, *The Nature of Money*, Malden, MA: Polity Press, 2004, p. 4-5.

13. Evan Soltas, 'Bitcoin Really Is an Existential Threat to the Modern Liberal State', *Bloomberg View*, 5 April 2013, <http://www.bloombergview.com/articles/2013-04-05/bitcoin-really-is-an-existential-threat-to-the-modern-liberal-state>.

14. Jon Matonis, 'Bitcoin Prevents Monetary Tyranny', *Forbes*, 4 October 2012, <http://www.forbes.com/sites/jonmatonis/2012/10/04/bitcoin-prevents-monetary-tyranny/>.

15. On Bitcoin's similarity to the wide spectrum of non-monetary media of exchange, such as 'Chocolate Hanukkah Coins, Casino Chips, Monopoly Money and Your Frequent Flyer Miles', see Gans, 'Time for a Little Bitcoin Discussion'.

face of current stories about gold and silver prices being part of the conspiratorial LIBOR price fixing scandal.¹⁶ This preference for gold versus what they somewhat inaccurately call the 'fiat currency' of nation-states only shows the ideological nature of their assertions, since gold exists right now, is widely traded and untraceable, largely resistant to counterfeiting, and yet is widely used (though not as a currency peg) by the very nation-states and central banks that Bitcoin advocates dislike.

The comparison with gold opens the door to the cryptopolitics that underlie too much writing and thinking about Bitcoin. Many of its most vociferous advocates rely on characterizations of the Federal Reserve as a corrupt idea in and of itself, a device run by conspiratorial bankers who want 'the state to control everyone's lives'.¹⁷ These claims are grounded in rhetoric propounded in the U.S. and across the world by far-Right politicians like Ron Paul, a vocal advocate of Bitcoin, whose bald declarations about the Federal Reserve are far more ideological than substantive in nature. Paul claims to want the abolition of the Fed and a return to the Gold Standard, as if this would result in the kind of absolute economic freedom libertarians demand, which is itself a line of argument with deep connections to racist conspiracy theories in which both Pauls have long been implicated.¹⁸ Yet history shows that gold standards themselves are regulatory in nature, and no more free from manipulation, derivation and speculation than are any other currencies; gold itself provides clear evidence of this, in its recent price volatility.¹⁹

Such beliefs require one to ignore the direct evidence before one's own eyes. Precisely because it is outside of regulatory structures, Bitcoin is particularly prone to the kinds of hoarding, dumping, derivation, and manipulation that characterize all instruments that lack central bank control and regulatory oversight by bodies like the SEC. Contrary to the advocates' claims, unregulated securities instruments are everywhere in contemporary finance; there is convincing evidence that the inability of the Commodities Futures Trade Commission to establish regulatory authority over CDOs and CMOs is the proximate cause for the economic crisis of 2008.²⁰ Now the lack of regulation of

16. For the view that gold-backed money is superior and that Bitcoin is valuable because it is 'like gold', see, e.g., Alec Liu, 'Why Bitcoins Are Just Like Gold', *VICE Motherboard*, 21 March 2013, <http://motherboard.vice.com/blog/why-bitcoins-are-just-like-gold>. On the historical fixing of gold prices, see 'Gold Fix: The London Gold Fix', *BullionVault*, <https://www.bullionvault.com/guide/gold/Gold-fix>. On the potential implication of gold and silver price fixing in the LIBOR scandal, see Simon Goodley, 'Could Gold Be the Next LIBOR Scandal?', *The Guardian*, 13 March 2013, <http://www.theguardian.com/business/2013/mar/13/london-financial-sector-gold-market/>.

17. Weiner, 'Paul Krugman Is Wrong: Bitcoin Isn't Evil, But Monetary "Stimulus" Is'.

18. On the anti-Semitic content of anti-Federal Reserve and pro-gold discourse, see, e.g., Gerald Krefetz, *Jews and Money: The Myths and the Reality*, Boston, MA: Ticknor and Fields/Houghton Mifflin, 1982. On the many connections between the Paul's and racist conspiracy theories, see, e.g., 'Ron Paul Sites Are Obsessed with Jews, Zionists, and Israel', *RonPaulSupporters.com*, 27 December 2011, <http://ronpaulsupporters.com/ron-paul-sites-are-obsessed-with-jews-zionists-and-israel/>.

19. On manipulation of gold and Bitcoin, see David Andolfatto, 'Why Gold and Bitcoin Make Lousy Money', *Economist's View*, 24 April 2013, <http://economistsview.typepad.com/economistsview/2013/04/why-gold-and-bitcoin-make-lousy-money.html>. On the recent volatility of gold, see Katie Allen, 'Gold Price Volatility Hits Pawnbroker's Profits', *The Guardian*, 29 September 2013, <http://www.theguardian.com/business/2013/sep/29/gold-price-volatility-pawnbroker-profits>.

20. See 'Interview with Brooksley Born', *Frontline*, October 2009, <http://www.pbs.org/wgbh/pages/frontline/warning/interviews/born.html>.

Bitcoin means that hoarders (as of December 2013, half of all Bitcoins were owned by approximately 927 people, such fight-the-power revolutionaries as the Winklevoss twins of Facebook infamy among them) can use all sorts of sophisticated trading methods to manipulate the market.²¹ It means that fly-by-night operations can come and go, stealing huge amounts of Bitcoin for themselves (as the operators of the short-lived Silk Road drug supermarket replacement ironically called the Sheep Marketplace appear to have done), or being emptied out by others, all of which may be the story of Mt. Gox.²²

Bitcoin's incredible volatility and lack of regulation, celebrated by cyberlibertarians, actually prevent the cryptocurrency from being used in just the way its advocates claim. The very reason central banks regulate the value of currencies is to ensure one of the three major functions of money: to be a stable source of value. The Bitcoin experiment demonstrates a law of finance that has never yet been disproven: absolutely unregulated markets result in extreme boom and bust cycles.²³ If Bitcoin becomes regulated enough to serve as a stable store of value and to ensure debacles like Mt. Gox don't happen in the future, it may be useful as a global system of payments (but so are generally non-transformative technologies like PayPal and Dwolla). But that will hardly shake world political structures at their foundations. If it remains outside of all forms of both value and transactional regulation, Bitcoin will continue to be a very dangerous place for any but the most risk-tolerant among us (i.e., the very wealthy, whose interest in Bitcoin should indicate to advocates how and why it cannot be economically transformative) to put our hard-earned money.

As Bitcoin hit an all-time high (albeit briefly) of more than U.S.\$ 900 mark in late 2013, it wasn't hard to find – in fact it was difficult to avoid – cyberlibertarians of all stripes celebrating this surge and similar ones in the past as proof of Bitcoin's importance.²⁴ While the surge does indicate something, it is beyond remarkable to read celebrations of the surge as if it demonstrates Bitcoin's feasibility as what it is advertised to be, a currency: because it is only through an incredibly blinkered and uninformed worldview, one typical of the paradoxes found throughout cyberlibertarian discourse, that dramatic surges in the (relative) value of an instrument can be understood this way, since under any conventional economic theory such surges prove *not* that it is a new government-toppling currency, but to the contrary, that it is nearly *useless* as a currency. Like so many other parts of cyberlibertarian discourse, Bitcoin's supposed power is so fully and transparently perched on blatant contradictions that it is surprising to find people taking it seriously, and yet if anything exposure of these contradictions seems only to inspire a renewed seriousness and missionary zeal on the part of Bitcoin advocates.

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21. Rob Wile, '927 People Own Half of All Bitcoins', *Business Insider*, 10 December 2013, <http://www.businessinsider.com/927-people-own-half-of-the-bitcoins-2013-12>.
 22. On the Sheep Marketplace, see Jim Edwards, 'Two Guys on Reddit Are Chasing a Thief Who Has \$220 Million in Bitcoins', *Business Insider*, 4 December 2013, <http://www.businessinsider.com/220-million-sheep-marketplace-bitcoin-theft-chase-2013-12>. On Mt. Gox, see Pete Rizzo, 'Tokyo Police Launch Investigation into Missing Mt. Gox Bitcoin', *CoinDesk*, 30 July 2014, <http://www.coindesk.com/japan-police-launch-investigation-missing-mt-gox-bitcoin/>.
 23. David Golumbia, 'Bitcoinsanity 1: The (Ir)relevance of Finance, or, It's (Not) Different This Time', *Uncomputing*, 6 January 2014, <http://www.uncomputing.org/?p=307>.
 24. See e.g., Rick Falkvinge, 'The Target Value for Bitcoin Is Not Some \$50 or \$100. It is \$100,000 to \$1,000,000', *Falkvinge.net*, March 2013, <http://falkvinge.net/2013/03/06/the-target-value-for-bitcoin-is-not-some-50-or-100-it-is-100000-to-1000000/>.

In many ways this is a familiar story about the arrogance of those who identify strongly with 'the digital'. Engineers imagine that their domain-specific knowledge translates into universal knowledge ('guys [who] are really good at what they do, and [who] think that makes them an expert at everything'²⁵); that all problems are engineering problems and that unsolved problems simply indicate that nobody as smart as they are has come along to solve those problems; that domain-specific knowledge is a kind of 'elitism' meant to keep out true experts like them.²⁶ It's also a story about the permeability of cyberlibertarianism to Tea Party-style libertarianism, as lurking under the celebration of Bitcoin is an endorsement of Ron Paul-ite conspiratorial assertions about monetary policy that do not stand up to scrutiny, even, for the most part, from more reputable Right and Libertarian economists.²⁷ Together, we have the spectacle of rabid cyberlibertarians like Pirate Party leader Rick Falkvinge promoting Bitcoin *because it displays exactly those features that disqualify it for its putative use*. While Falkvinge may be the most visible and loudest advocate of this contradictory 'analysis', one need only check the comment boards for any article raising critical questions about the economics of Bitcoin to see it being repeated, *ad nauseum*, and in a typically trolling and dismissive style of any point of view not based directly on grasping the genius of the Bitcoin algorithm.²⁸

To see this, one need only start at the beginning. Bitcoin is touted as a replacement for 'fiat currency'. Although it has a longstanding basis in many economic theories, 'fiat currency' is today mostly a buzzword from the extreme edge of libertarian economics and especially from Paulites. The ordinary definition of 'fiat currency' is:

25. From a comment by 'volokh_disqus2' to Orin Kerr, 'A Few Thoughts on the DOJ Brief in the Lavabit Case', *The Volokh Conspiracy*, 14 November 2013, <http://www.volokh.com/2013/11/14/thoughts-doj-brief-lavabits-case/#comment-1124546635>.

26. Discussed at some length in Golumbia, *The Cultural Logic of Computation*, Cambridge, MA: Harvard University Press, 2009.

27. For libertarian economic criticisms of Bitcoin that distinguish themselves from Paulite/Tea Party conspiratorial theories about central banking, see, e.g., the writings of the Mises Institute economists, including Frank Shostak, 'The Bitcoin Money Myth', Ludwig von Mises Institute, 17 April 2013, <https://mises.org/daily/6411/>, and Patrik Korda, 'Bitcoin: Money of the Future or Old-Fashioned Bubble?', Ludwig von Mises Institute, 9 April 2013, <https://mises.org/daily/6401/>. Also see well-known internet investment analyst Henry Blodget making much the same fiscal argument I am advancing here, in 'Bitcoin Could Go To \$1 Million', *Business Insider*, 8 November 2013, <http://www.businessinsider.com/bitcoin-price-2013-11>.

28. In addition to their ubiquity on Bitcoin advocacy sites like Falkvinge.net and Coindesk.com, they are the rule in the comments sections in most stories about Bitcoin, especially those which entertain any skepticism at all about Bitcoin's transformative power; see for example the comments to Timothy Lee, 'Everything You Need to Know About the Bitcoin "Bubble"', *The Washington Post*, 8 November 2013, <http://www.washingtonpost.com/blogs/the-switch/wp/2013/11/08/everything-you-need-to-know-about-the-bitcoin-bubble/>, to Stephen Mihm, 'Are Bitcoins the Criminal's Best Friend?', *Bloomberg View*, 18 November 2013, <http://www.bloombergview.com/articles/2013-11-18/are-bitcoins-the-criminal-s-best-friend->, and to Rumpelstatzkin, 'Everything I Was Afraid to Ask About Bitcoin but Did', *Naked Capitalism*, 21 November 2013, <http://www.nakedcapitalism.com/2013/11/everything-i-was-afraid-to-ask-about-bitcoin-but-did.html>. Also see the comments collected by the Twitter account 'Shit /r/Bitcoin says' (@shit_rbtc_says, https://twitter.com/shit_rbtc_says), some of which are discussed in David Golumbia, 'Bitcoinsanity 2: Revolutions in Rhetoric', *Uncomputing*, 26 June 2014, <http://www.uncomputing.org/?p=1390>. Vasilis Kostakis and Chris Giotitsas, 'The (A)Political Economy of Bitcoin', *TripleC: Communication, Capitalism, & Critique* 12:2 (2014): 431-440, attempt to integrate thinking about Bitcoin with more community- and labor-oriented analyses of issues in money and currency.

Fiat money is money that derives its value from government regulation or law. The term *fiat currency* is used when the fiat money acts as the main currency of the country. The term derives from the Latin *fiat* ('let it be done', 'it shall be')

The Nixon Shock of 1971 ended the direct convertibility of the United States dollar to gold. Since then all reserve currencies have been fiat currencies, including the U.S. dollar and the Euro.²⁹

In the simplest terms, 'fiat money' is money without 'intrinsic value' – that is, where the token used as currency for that money has reasonable value in another context. The most typical example of non-fiat currency is gold, because gold has many uses and is still valuable even when not in circulation as currency; paper money, on the other hand, is taken to be fiat because the paper on which it is printed is nearly valueless as paper. This distinction is actually much harder to make than advocates want us to think; more on this below. As the Wikipedia entry goes on, 'while gold- or silver-backed representative money entails the legal requirement that the bank of issue redeem it in fixed weights of gold or silver, fiat money's value is unrelated to the value of any physical quantity. Even a coin containing valuable metal may be considered fiat currency if its face value is higher than its market value as metal'.

What is supposed to be wrong with fiat money? This is an age-old story for ideologues to the right of economic libertarians; it's one of the favored talking points of the Paul clan.³⁰ The supposed problem with fiat currency is that it makes impossible one of the three functions of money: its role as a *store of value*. The stability of value they claim (erroneously) proceeds from either the use of valuable instruments as currency (e.g., gold used for coinage) or as a grounding mechanism for money itself (i.e., using a 'gold standard' for a nation's money supply) – while these two concepts are not at all the same, they are frequently blurred in gold-bug propaganda – not just economic instability but actual totalitarian political power is the inevitable result. As Ron Paul himself put it in 2003 before the U.S. House of Representatives, 'if unchecked, the economic and political chaos that comes from currency destruction inevitably leads to tyranny'.³¹

What people like Paul supposedly hate about 'fiat' currencies is that 'central bankers' can manipulate the value of the currency, supposedly unlike asset-backed currencies like gold. The whole point of this is to have a stable currency. A currency whose value does not fluctuate wildly. But because Bitcoin is completely uncontrolled, it cannot separate its asset from currency functions. That means that when it appears to be deflating, investors (i.e. 'hoarders') will jump in, as they are doing now. The problem with this is that, in just the way the libertarians scream about, it makes the instrument *too volatile to use as a store of value*.

29. Wikipedia contributors, 'Fiat Money', http://en.wikipedia.org/wiki/Fiat_money, accessed 15 September 2014.

30. See e.g., Barbara Shoff, 'Ron Paul Sound Currency Message Is Resonating with Worldwide Leaders, Including China', *PolicyMic*, 18 October 2012, <http://mic.com/articles/16690/ron-paul-sound-currency-message-is-resonating-with-worldwide-leaders-including-china>.

31. Ron Paul, 'Paper Money and Tyranny', Speech to U.S. House of Representatives (September 2003), <http://www.house.gov/paul/congreg/congrec2003/cr090503.htm>.

The problem with ‘fiat currency’ is value fluctuation. The most dangerous kind of value fluctuation is the deflationary spiral – it’s usually considered worse, even, than the kind of inflationary spiral experienced in the 1990s and 2000s by the Zimbabwean dollar. That is, a merchant cannot hold onto their Bitcoins as profit, because they have no guarantee that their profits will be worth the amount they were when they took the profit. The 6 Bitcoins I get for selling a lawnmower today, may (likely will) only buy me a box of cereal tomorrow. This forces people to constantly transfer their Bitcoins into the supposedly-outdated national currencies underpinning Bitcoin, which are actually necessary for it, rather than being the old-fashioned predecessors to it.

Which world currency is currently experiencing among the most dramatic deflationary spirals anyone has ever seen? Bitcoin itself, the ‘existential threat to the liberal nation state’.³² Any sane person putting their life’s savings into Bitcoin among all world currencies right now is as foolish as a Dutch person buying tulip bulbs. That is because the problems with currencies actually aren’t formal, or mechanical, or algorithmic, despite what Bitcoin propagandists desperately want us to believe. They are social and political problems that can only be solved by political mechanisms. That is why, despite the rhetoric of Bitcoin advocates, right now most sovereign currencies are far more stable than Bitcoin will ever or can ever be (since Bitcoin has no mechanism for value control whatsoever, and its eventual limit to a total number of coins is designed to be deflationary, apparently due to a built-in conspiratorial and typically right-wing suspicion of inflation). Bitcoin advocates have an historically-disproven belief that lack of regulation produces stability – when the historical data shows time and time again that lack of regulation produces boom-and-bust cycles of an intensity far greater than the central bank regulation Bitcoin advocates loathe so much.

Many economists recognize something that appears to have been beyond the inventors and advocates of Bitcoin. Without direct regulatory structures that prevent an instrument from being used as an investment (aka ‘hoarding’), any instrument (*even gold*) will be subject to derivation, securitization, and ultimately extreme boom-and-bust cycles that central banks are tasked to prevent. The more Bitcoin fluctuates in value, the less functional it can be as a currency. The less impact it can have on ‘world governments’, whatever that is supposed to mean. *The more Bitcoin ‘rises in value’ – that is, experiences radical deflationary spirals – the more it fails to be money.*

In fact, because the cycles of rapid deflation and inflation provoke constant exchanges of Bitcoin for other stores of value, usually national currencies, Bitcoin can more readily be understood not merely as a commodity, as just one among many other digital commodities, but also as a kind of derivative itself – an option or futures contract related to the value of other instruments and on which investors of all sorts can speculate and, depending on the volume of transactions, even manipulate the market. Given Bitcoin’s foundational anti-regulatory stance, it is almost inconceivable that major players are refraining from such manipulation. Thus the involvement of high-profile players like the Winkelvoss twins, too, cannot be a cause for celebration of Bitcoin’s potential as a currency, but rather demonstrates its utility as a manipulable commodity for typical, existing capital to use to its own ends. In this sense, it becomes a tool for existing power to

32. Soltas, ‘Bitcoin Really Is an Existential Threat to the Modern Liberal State’.

concentrate itself, rather than a challenge to the existing order – as many of its more economically-informed commentators consistently point out, ‘more like a speculative investment than a currency’.³³

Few attitudes typify the paradoxical digital libertarian mindset of Bitcoin promoters (and many others) more than those of ‘Sanjuro’, the alias of the person who created the Bitcoin ‘assassination market’ written up by Andy Greenberg.³⁴ He believes that by incentivizing people to kill politicians, he will destroy ‘all governments, everywhere’. This ‘will change the world for the better’, producing ‘a world without wars, dragnet panopticon-style surveillance, nuclear weapons, armies, repression, money manipulation, and limits to trade’. While not directly about the revolutionary powers of Bitcoin, the sentiment flows from the same fount of misguided computational ‘wisdom’. Only someone so blinkered by their ideological tunnel vision could look at world history and imagine that murdering democratic governments out of existence would do anything but make every one of these problems immeasurably worse than they already are.

To be fully accurate, Bitcoin is not really a piece of software on its own – or rather, it is software written using a model that is applicable both to other very similar pieces of software (other cryptocurrencies like Litecoin, Dogecoin, and so on), and also to a wide array of other technical functions. The concept of the cryptographically-enabled distributed ledger, and the ‘blockchain’ used to implement it by current cryptocurrencies, advocates tell us, have wide application outside of their uses: a technology as revolutionary today as were ‘personal computers in 1975, the internet in 1993’, we hear not infrequently.³⁵ Networks built on such technologies are *technically* decentralized, we are told, in a way that the current internet is not, and thus allow a range of services and opacity to inspection (and therefore legal as well as unlawful surveillance). Advocates are right that it is difficult to grasp the potential uses of such networks without seeing them in action, but on the surface they seem structured around promises that appeal to and reinforce specific political ideologies.³⁶ These are almost exclusively ideologies that are broadly libertarian in character and that serve the neoliberal agenda: they follow Friedrich Hayek and his disciple Jimmy Wales in believing that markets, not formal political structures, are the only valid means for knowledge to be gained and power to be wielded, and that ‘the good will win out’ if we impose competitive market structures over parts of society, like the issuance of money, that governments have claimed as part of their domain. Despite their frequent use of the word ‘democratization’, such efforts are profoundly anti-democratic, insisting that the introduction of devices and software by a self-identified technocratic elite trumps duly-enacted laws and law enforcement mechanisms, and that a kind of market – a market in adoption of such services – is the exclusive method society should use to judge the provision of these services. The most fervent advocates of such strategies are open in their rejection of democratic governance:

33. Yermack, ‘Is Bitcoin a Real Currency?’: 1.

34. Andy Greenberg, ‘Meet the “Assassination Market” Creator Who’s Crowdfunding Murder With Bitcoins’, *Forbes*, 18 November 2013, <http://www.forbes.com/sites/andygreenberg/2013/11/18/meet-the-assassination-market-creator-whos-crowdfunding-murder-with-bitcoins/>.

35. Marc Andreessen, ‘Why Bitcoin Matters’, *The New York Times*, 21 January 2014.

36. See Alexander R. Galloway, ‘Reticular Fallacy’, 6 October 2014, <http://cultureandcommunication.org/galloway/the-reticular-fallacy> on presumptions about the politics of networks.

"We see this as part of the total sublation of the state", said Cody Wilson [...] who gained fame earlier this year when he published online the blueprints to a pistol that could be manufactured with a 3D printer. "I know I sound like some kind of weird Jehovah's Witness, but we've only just begun. We admit that we are ideologues."³⁷

There was a time when it would have been relatively difficult to imagine a software platform that had more power in a political sphere than in its stated uses; it also used to be hard to imagine right-wing extremists like Cody Wilson being quoted as authoritative about anything in our nation's leading newspapers. It is an index of Bitcoin's power as ideology that today such statements pass without notice, and it is no less an index of the threat such technologies pose to democracy itself.³⁸ It is a threat the advocates of such technologies themselves frequently advertise, and it is this feature of Bitcoin and cryptocurrencies that political thinkers of different orientations need to take seriously.

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37. Alan Feuer, 'The Bitcoin Ideology', *The New York Times*, 15 December 2013, <http://www.nytimes.com/2013/12/15/sunday-review/the-bitcoin-ideology.html>. For background on Cody Wilson and his support for 3D-printed guns, see Jacob Silverman, 'A Gun, a Printer, an Ideology', *The New Yorker*, 7 May 2013, <http://www.newyorker.com/tech/elements/a-gun-a-printer-an-ideology>.

38. Exceptions to this rule – political analysis that recognizes how closely tied is Bitcoin discourse to far-right political beliefs – include Maurer, Nelms, and Swartz, 'Practical Materiality of Bitcoin', and Brett Scott, 'Visions of a Techno-Leviathan: The Politics of the Bitcoin Blockchain', *E-International Relations*, 1 June 2014, <http://www.e-ir.info/2014/06/01/visions-of-a-techno-leviathan-the-politics-of-the-bitcoin-blockchain/>.

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THE ECONOMIC VIABILITY OF COMPLEMENTARY CURRENCIES: BOUND TO FAIL?

BEAT WEBER

THE ECONOMIC VIABILITY OF COMPLEMENTARY CURRENCIES: BOUND TO FAIL?

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Bitcoin and similar cryptocurrencies are the latest embodiments of a longer history of attempts to establish something that is frequently labeled as ‘complementary currency’ (CC). Complementary currencies are issued by entities other than national central banks and are intended to circulate alongside official currencies, as well as occasionally serving particular purposes thought to be underserved by official currencies. To some, CC projects look like attractive shortcuts to solve various problems. But almost all attempts ultimately fail to take off after initial enthusiasm. Why?

In times of economic and financial crisis, the issue of money becomes paramount. The number of people and areas where money is sparse is increasing. The institutions specialized in handling money (banks and the financial system in general) suffer from decreasing trust in the wake of banking crises and their consequences: expensive public assistance to stabilize the financial system, high debt burdens, and receding credit availability. In this context, the appropriate level and means of collective action to remedy the situation becomes an issue of debate. In many grassroots circles, currency reformers propose what seems to be a radical solution through the creation of one’s own currency. Instead of engaging in the exhausting struggle for appropriate national economic policies to remedy the situation, the creation of a complementary currency seems to allow likeminded people to go it alone. Such a currency project promises to bypass the resistance of established powers and divided public opinion, and to help its users build their own economic community.

Making the connection between political communities and currencies is not unfounded: most currency areas in the current world coincide with national borders, (the Euro being a notable exception), so currencies reflect community building around national states. If a nation is split into divisive political camps, why not create communities around common goals and create currencies to represent these communities in the economic sphere? Indeed, grassroots complementary currency projects can initiate enthusiasm and effort that promotes ties among community members and in that way yield many social benefits.² In democratic theory, legitimacy can be conceived as input and output legitimacy. Input legitimacy refers to the extent to which community mem-

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1. The views expressed in this text do not necessarily coincide with those of my employer. I am grateful to Stefan Schmitz for comments on an earlier draft of this paper.
 2. Gill Seyfang and Noel Longhurst, ‘Money, Money, Money? A Scoping Study of Grassroots Complementary Currencies for Sustainability’, 3S *Working Paper*, 2012.

bers have a voice in a project. Output legitimacy refers to the ability of the project to deliver expected results. While complementary community currencies can claim input legitimacy by building on participation of community members, the question of output legitimacy is trickier. Can complementary currencies work as money?

Money is the general equivalent in capitalism – commodities do not buy each other, but all commodities can be bought with money. Based on this status, money is used for three purposes: 1. As unit of account in which prices are measured and compared in money; 2. As means of payment: goods and services are purchased and debts settled with money; 3. As the most liquid store of value. Facing an uncertain future with respect to their income and their economic needs and obligations, people hold money to insure themselves against unforeseen expenditures. In contrast to other forms of storing wealth (real estate, financial assets, and other items of value), money offers the advantage of being immediately available to buy commodities. That feature is referred to as money's superior liquidity.³

In general, the price system is based on the single unit of account. In the Eurozone, all prices are calculated and displayed in Euro. This aspect of money tends to be a monopoly within a currency area. The more goods and services are denominated in a single unit of account, the better people can compare prices among competing offers and get the best value for their money.

Under one unit of account there can be several media of payment. While the central bank is the issuer of money denominated in the unit of account of the same name, claims on banks and other issuers of media of payment circulate alongside central bank issued money. But banks as issuers must guarantee a par relationship with cash (i.e. one Euro is one Euro, irrespective of the form and issuer – cash or bank issued non-cash).

Concerning the third aspect of money (store of value), many things can be used to store value, money only being the most liquid one. Money in this case is particularly important in situations of crisis, where people may lose their faith in the value of everything except money.

In most of Europe, money consists today of notes, coins (i.e. cash) and bookkeeping entries issued by the central bank and the sovereign mint, and of bank deposits which represent a claim on the former. Most payments among people in everyday life consist of bank deposit transfers (while banks settle the resulting net balances among each other with deposits at the central bank). In addition, transactions among enterprises are sometimes based on mutual credit.

Banks, as the most important issuers of media of payment in the modern economy, are subject to regulation and supervision by the state and the central bank. The means of payment issued by banks and central banks can be considered part of the same

3. Geoffrey Ingham, *The Nature of Money*, Cambridge: Polity Press, 2004; Makoto Itoh and Lapavistas Costas, *Political Economy of Money and Finance*, Hampshire and London: MacMillan Press, 1999.

currency: they share the same unit of account, banks strive to uphold their promise to exchange bank deposits into cash on demand, and the issuing behaviour of banks is subject to surveillance by authorities.

In contrast, complementary currencies could be characterized as means of payment issued by entities that are not subject to coordination with official money issuing authorities (state and central bank). Their media of payment are not necessarily denominated in the official unit of account and do not necessarily guarantee par relationship with official currency.

To answer the question whether CCs can work as money, a typology of possible meanings of complementarity is proposed as a first step and illustrated with historical examples. In a second step, I discuss determinants of successful currencies in general.

What Does Complementarity Mean?

Today cash, consisting of notes and coins, is issued exclusively by the state and its central bank in most currency areas. Banks issue checkable deposits that serve as means of payment in everyday economic transactions and are subject to state regulation and supervision.

Historically, the state was not always the sole issuer of cash. In many English speaking and a few continental European countries, private banks issued their own notes in the 18th and 19th century, redeemable in precious metal.⁴ Costly non-par exchange among competing issuers, widespread counterfeiting and recurring bank failures made the costs of such a system so striking that public support grew for a stronger state role.⁵

But even after centralization, in a number of episodes in modern economic history, complementary currencies issued by entities other than the sovereign or banks have circulated. We can distinguish these episodes by the CCs respective field of application, giving specific meanings to the term *complementarity* in each.

a) Complementarity with Respect to Specific Currency Denominations

Examples include small denomination coins privately issued by shops and bars to overcome shortage of small change in times when the availability of official coins was impaired due to war, crisis, or specific policies.

In the U.S. in the 19th century, private banknote issue was dominant. But banks were legally prevented from issuing small-denomination banknotes.⁶ Merchants, farmers

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4. Lawrence H. White, 'Competing Money Supplies', in David R. Henderson (ed.) *The Concise Encyclopedia of Economics*, Indianapolis: Liberty Fund, 2007, pp. 71-73; Stefan W. Schmitz, 'Will Central Banking Survive Electronic Money?', in Stephen Millard, Andrew Haldane, and Victoria Saporta (eds) *The Future of Payments*, London: Routledge, 2007, pp. 233-254.
 5. Warren E. Weber, 'The Efficiency of Private E-money-like Systems: The U.S. Experience With State Bank Notes', *Bank of Canada Working Paper*, 2014-15.
 6. The reason for this ban can be found in an attempt by banks to install a disciplining device against banknote overissuance. In the system under consideration, banknotes had to be redeemable in gold held by banks. With large-denomination notes, so the argument went, the public would have a greater incentive to continually redeem them in gold. Small denomination notes on the other hand would circulate for too long a time, therefore offering banks an incentive to overissue them.

and companies filled the gap by issuing paper currency notes and tokens in small denominations, denominated in dollars, or goods and services rendered. These tokens could be used to pay for products of the issuer and sometimes circulated among the general public. The same happened during the U.S. civil war, when inflation led the price of precious metals to rise above their minted value in coins, causing metallic coins to disappear from circulation. Eventually, authorities filled the temporary gap again, and the use of private substitutes receded.⁷

Many observers see small denomination online payments as a current example where usage of official currency is impaired by high transaction fees of payment service providers, opening a window for complementary currencies. In this case, it is not the unavailability of official currency in small denominations per se but the prevailing transaction costs involved in making online payments, which may deter users from making small denomination payments in official currency. Established payment service providers (like Paypal, credit card firms, Western Union etc.) charge fees for their services which can be so high in relation to the payment sums as to deter small-sum transactions altogether. Filling that gap is one of the uses which Bitcoin and similar cryptocurrency schemes are designed for. By making the provision of payment services a byproduct of competition among Bitcoin 'miners' for obtaining new currency from the vault, transaction fees for users are kept very low in the introductory phase of the project. In contrast to payment service providers in official currencies, who have to recover their costs through fees, the Bitcoin network compensates their service providers with newly issued currency. Based on the expectation that limited supply will increase Bitcoin's value in terms of official currency, the network has so far been able to attract sufficient volunteers ('miners') ready to engage in that gamble, in turn enabling cheap transactions among users of its payment network (that nevertheless entail considerable loss risks).⁸

b) Complementarity with Respect to Specific Geographical Areas

There were a number of episodes in history where regions (or private actors within regions) temporarily introduced complementary currencies because they experienced shortage of cash in the wake of interruptions of the financial infrastructure.

Mining and lumber companies of the 19th century in the U.S. and elsewhere were often active in remote locations. Setting up company towns and serving their staff through company stores, these companies often issued their own currency (redeemable against goods in the company store) to pay workers. They could thereby overcome costs and risks involved in large distance transportation of physical currency,⁹ and profit from the advantages in holding a local monopoly in offering employment and goods, pricing them and issuing the means of payment. Prisoner of war camps, military bases abroad and ships on long voyages have also set up similar schemes.

7. Bruce Champ, *Private Money in Our Past, Present, and Future*, <http://www.clevelandfed.org/research/commentary/2007/010107.cfm>.

8. Beat Weber, 'Can Bitcoin Compete With Money?', *Journal of Peer Production* 4 (2014), <http://peerproduction.net/issues/issue-4-value-and-currency/invited-comments/can-bitcoin-compete-with-money/>.

9. Bruce Champ, *Private Money in Our Past, Present, and Future*, 2007, <http://www.clevelandfed.org/research/commentary/2007/010107.cfm>.

With growing reach of financial infrastructure and the diffusion of electronic forms of payment, such arrangements have become more or less superfluous.

During the Great Depression of the 1930s, banks in many regions closed or restricted the amount of cash customers could withdraw after experiencing runs on their deposits. To counter the resulting liquidity shortages, many regional authorities in the U.S., Germany, Austria, and other countries resorted to issuing so called 'scrip money'. These were means of payment denominated in the official unit of account and redeemable for either proper money at a future date, for goods (as offered either by the issuer or some other producers ready to accept scrip) or as discharge of local tax liabilities.¹⁰ A similar phenomenon was observed in Russia's transition from a centrally planned economy in the 1990s.¹¹ In a political crisis concerning the state budget in 2009, even the state of California resorted to issuing IOUs to meet its short-term financial obligations for a few months.¹² In the recent crisis of 2008 – which in many ways was compared to the Great Depression – policy makers in most industrialized countries took measures to prevent deflation and breakdown of the financial infrastructure comparable to the 1930s. In some countries though, policy constraints prevented the use of such measures, leading to a renewed interest in currency related innovations.

An often-cited modern case in this respect is Argentina. When Argentina was hit by a financial crisis in 2001, access to bank accounts was severely impaired, leading to a surge in surrogate means of payment. Regional authorities issued scrip money and individuals joined barter clubs, where club means of payment were issued to facilitate trade of goods and services among members. After a few months, instances of fraud and mismanagement within these arrangements and an improvement of overall financial stability led to the decline of private complementary currency use.¹³

Some regional complementary projects aim at reducing leakage of purchasing power and reorienting economic circulation towards the regional level. As envisaged by currency reformer Silvio Gesell in the 1920s, some of these projects involve demurrage. These currencies deliberately lose value over time, thereby encouraging their fast circulation and discouraging hoarding. Sometimes such currencies are taken up and seem partly successful, to some extent because their novelty factor makes them popular with tourists and currency collectors. But in general they fail to cover much ground because they entail structural problems. Offers, which prove uncompetitive on the market, cannot be rendered competitive by offering potential customers a different currency unless it gives access to a hidden form of price reduction, i.e. when local currencies are de facto vouchers granting their users discounts off list prices at local merchants. Typical regional currencies offer less choice than official currency. At best they are accepted by local merchants, and if they entail demurrage, they favor fast

10. Bruce Champ, *Stamp Scrip: Money People Paid to Use*, 2008, <http://www.clevelandfed.org/research/commentary/2008/0408.pdf>.

11. David Woodruff, 'Monetary Surrogates and Money's Dual Nature', in Jocelyn Pixley and G.C.Harcourt (eds) *Financial Crises and the Nature of Capitalist Money. Mutual Developments from the Work of Geoffrey Ingham*, Houndsmill and New York: Palgrave, 2013, pp. 101-123.

12. See http://www.sco.ca.gov/eo_news_registeredwarrants.html.

13. Thomas Greco, *The End of Money and the Future of Civilization*, White River Junction: Chelsea Green Publishing (Kindle Edition), 2009, p. 2943.

consumption spending which might not be in line with consumers preferences. Their use does not provide access to any goods that are unavailable in official currency. So the network is smaller compared to official currency, offering a smaller choice of uses. Those uses (i.e. the goods and services accessible via the currency) are non-distinct from the potential uses of official currency, and – in the case of demurrage-based operation – the issuer deliberately impairs the currency's full functioning as money by making it useless for storing wealth.

Making use of the currency mainly promises to contribute to the collective good of regional prosperity, although that depends on whether and how any additional incomes created by regional currency circulation are distributed within the region. But if people before the introduction of regional currency were not willing to 'buy local' with official currency and instead preferred greater choice, why should they give up official currency in favor of a complementary currency which offers less choice? The discrepancy between people's individual consumer preferences and their wish for regional prosperity reflects a tension between individual and collective rationality.

Introducing a regional currency does not eliminate this dilemma but simply shifts it from the stage where consumption decisions are made towards the stage where the means of payment are chosen. It is only under specific circumstances that such a shift might indeed make a difference. If the choice of the means of payment is exposed to greater transparency and closer community surveillance, peer pressure could be more effective than in the application on dispersed individual shopping behavior. Regional currencies can also have a marketing effect that raises awareness among potential users. But as long as the economy is based on markets where individual choices of producers and consumers determine outcomes, instead of collective decision making with binding consequences for individuals, individual preferences are likely to prevail whenever there is a dilemma between individual and collective rationality.

Complementary currency projects with demurrage features assume that money can be reduced to serve as means of payment in a process of mutual exchange. Uncertainties deriving from the current reality of a non-transparent economy, the decentralized decision making of private property owners, and the implications for investors dependent on expectation-based production efforts, are ignored. But in the modern economy, money fulfills an essential function beyond being a means of payment. Money is a unit of account, which is decisive for the formation of comparable prices, and it is the most liquid store of value. Liquidity offers a hedge against uncertainty intrinsic to a capitalist market economy. Many reformers want to do away with this function because if uncertainty increases and people make increased use of money as a store of value instead of investing it, money is hoarded and its circulation slows. The consequence can be a fall in consumption and investment and rising unemployment. Thus individually rational behavior yields dysfunctional collective results.

In order to successfully reduce uncertainty, economic prospects must be improved by economic policy. Depriving people of a store of value and trying to force them to spend is not a means to protect against uncertainty. Making money dysfunctional as store of value does not encourage people to stop hoarding; they simply start searching for different modes to preserve value or for a different kind of money.

c) Complementarity with Respect to Specific Contracts

Suppliers can decide to make specific goods, services, and transaction types more or less exclusively available through certain CCs. Examples include currencies issued by computer game producers that give access to virtual goods in online games, and private cryptocurrencies that enable illegal transactions and tax evasion.

In virtual online games like *World of Warcraft* or *Second Life*, the designers have introduced virtual currencies. In *Second Life*, users can enter into transactions with each other using Linden Dollar. The currency can be purchased from the game owner or from third party exchanges and used to purchase virtual goods and services (as offered by the game owner or other game users) within the game. The game owner tries to keep a stable exchange rate with the U.S. dollar by creating new Linden Dollars as demand increases. In *World of Warcraft*, users can buy equipment with digital 'gold coins' in order to help them advance in the game. Digital coins are given away by the game owners as rewards for successful players. They can also be obtained by selling virtual commodities produced or found by users. In addition, they can be obtained on exchanges, where 'gold farmers' sell the products of their in-game labour against official currency. In this way, players short on time can outsource the time-intensive advancement in the game for their online character by paying official currency. The work is typically done by young gamers rich in time but poor in money from countries like China and elsewhere. The game owners try to discourage and prevent the latter kind of transactions.

Game owners issue these currencies in order to financially motivate players, provide an incentive for customers to return once they have accumulated certain wealth ('lock-in'), and generate additional revenue for themselves.¹⁴ The basis of game currency success is that their issuers control access to goods in demand, which creates demand for the currency among game users.

In some respects, anonymous cryptocurrencies like Bitcoin and many of its variants are further examples due to their offering anonymity in making payments. Bitcoins do not have a central issuer but are issued by a community of users from a stock according to predetermined rules encoded in an open source software platform. The project does not offer any goods for sale that are exclusively available through Bitcoin. While Bitcoin and similar projects are intended by their inventors to rival existing currencies in all kinds of transactions, their main advantage as means of payment lies in transactions where there are reasons for transaction partners to avoid official currency (apart from the small denomination payments referred to above). In particular, money laundering and transactions in illegal goods can benefit from the anonymity offered by making payments in Bitcoin. (For regular consumer and business transactions, a currency like Bitcoin will not be widely used. When a currency is designed to increase in value over time, it is better to hoard it, and pay current expenditure with a currency that is more stable. Without an issuer guaranteeing a certain stability, Bitcoin is underqualified to serve as unit of account.)

In projects like the Japanese *Fureai kippu* and other time bank projects around the world, services like care work are evaluated based on labor time spent and rewarded

14. ECB (European Central Bank), *Virtual Currency Schemes*, Frankfurt, 2012.

with a credit for the supplier which can be spent at a future date on consumption of care benefits provided by other network members. Many members seem to perceive care work contributed under this system as being of superior quality, providing an incentive to join. In contrast to industrial labor, general care work is not subject to productivity differentials, making labor time spent a useful unit of account comparable among persons and over time: spending one hour with a person five years ago can be equalized with spending one hour with another person in five years. In contrast, one hour of industrial labor, for instance, in the garment industry may have resulted in one T-shirt five years ago, but may result in five T-shirts in five years, due to the continual technical advancement of machinery. As a consequence, time bank arrangements can be suitable in settings where one type of homogenous service of roughly constant quality is exchanged among people who deliver their contribution at different points in time. Their main challenge relates to uncertainty about whether one's own contributions can be exchanged at a future date for some reciprocal service – depending on the attractiveness of the network over time. When such arrangements attempt to include a broader range of goods and services, they run into the problem that their unit of account (units of labor time) does not make it profitable for all kinds of service suppliers to exchange their services according to such evaluation criterion. Would an experienced, productive craftsman be prepared to exchange one hour of her labor for an hour of labor by an apprentice? Would a doctor, who invested years of study, be prepared to exchange one hour of her labor for an hour of labor by an unprofessional care worker? Such issues typically trigger disputes over the appropriate value standard and lead to the exit of suppliers that can get a better deal in markets based on official currency.¹⁵

d) Complementarity with Respect to Specific Groups

In many grassroots campaigns, complementary currencies are envisaged as a way to promote economic exchange among participants lacking jobs and income in official currency. In local exchange trading systems (LETS), complementary currencies are introduced to overcome market exclusion of certain segments of the population or regional economic decline. While sharing some features with regional currency projects referred to above, their design does aim to a lesser extent at replacing official currency in existing trading relationships within a whole region than in creating new trading relationships among members of groups that may or may not be located within a specific region. In this context, 'a complementary currency [...] is an agreement to use something else than legal tender (i.e. national money) as a medium of exchange, with the purpose to link unmet needs with otherwise unused resources.'¹⁶

Since the 1980s, there has been growing interest in such initiatives. But while a number of grassroots projects have created early local enthusiasm for such projects, none of them has flourished for long or managed to reach a critical mass. Most falter after initial support energies fade.¹⁷

15. Ingham, *The Nature of Money*, p. 185.

16. Wikipedia, 'Complementary Currency', http://en.wikipedia.org/wiki/Complementary_currency, accessed 17 August 2014.

17. Jérôme Blanc, 'Classifying "CCs": Community, Complementary and Local Currencies' Types and Generations', *International Journal of Community Currency Research* 15 (2011) D 4-10, <https://ijccr.files.wordpress.com/2012/05/ijccr-2011-special-issue-02-blanc.pdf>; Greco, *The End of Money and the Future of Civilization*, p. 2659.

LETS networks use interest-free local credit, so direct bilateral barter-like swaps do not need to be made. No physical money is issued, but rather transactions are recorded in a central location open to all members. As credit is issued by the network members, for the benefit of the members themselves, LETS are considered mutual credit systems.¹⁸

The main challenge is to attract a significant number of reciprocal trade opportunities. Participants lacking alternative income sources will be easy to attract. Their motive is to get access to goods and services in high demand, but suppliers of the latter tend to have alternative sources of income and tend to be deterred by the perceived risk to lose out in LETS trades: the unemployed carpet cleaner and the piano teacher might join in the hope of offering their services for something they need, like food and clothing. But supermarkets offering food and clothing will tend to prefer official currency in payment and won't be attracted by a network offering piano lessons, carpet cleaning and related services in exchange for their products. As the Wikipedia entry on LETS puts it, 'Conventional national currency is generally hard to earn, but easy to spend. To date LETS systems are comparatively easy to earn, but harder to spend'.¹⁹

Why Currencies are Accepted

Having reviewed experience and prospects of various approaches towards complementary currencies, we can step towards some general observations drawing on economic theory. As the economist Hyman Minsky once quipped, 'Everyone can create his own currency, the problem is to have it accepted'. If that is so, what determines the acceptance of a currency by users?

In many accounts critical of existing monetary arrangements, it is assumed that official money is forced on users, based on 'legal tender' status.²⁰ But there is less behind this status than commonly believed. If you use the official currency in payment you will be protected by law against your transaction partner suing you for non-payment (unless the underlying contract specifies otherwise). And if you print your own banknotes, you will be prosecuted for counterfeiting. But you are free to agree on another means of payment than the official currency with your transaction partner in a private transaction. As long as you pay all applicable taxes in the official currency, you can, for instance sell your car in exchange for socks, Bitcoins, or something else. The episodes mentioned above meant to illustrate our typology, show that time and again in modern economic history privately issued currencies were able to gain foothold in the economy. So the legal status of official currency does not necessarily imply a full currency monopoly. In a world of multiple currencies there are always alternatives available to some extent. The extent of their use depends on the availability and advantages various currencies offer in comparison to available alternatives. Whenever there is more than one currency available, currencies must offer advantages to users in order to gain and uphold their acceptance.

Among the four types of complementarity reviewed above, I identified examples for successes and failures for all types except those based on complementarity with respect to specific groups, where no successful example was found. From the successful

18. Wikipedia, 'Local Exchange Trading System', accessed 23 November 2014.

19. Wikipedia, 'Local Exchange Trading System', accessed 23 November 2014.

20. Greco, *The End of Money and the Future of Civilization Money and the Future*, p. 2079.

examples, I can infer that CCs can gain traction in two cases. The first case is where they fill a gap left by official currency – when there are hurdles to accessing or using official currency despite the presence of potential transactions among solvent transaction partners. In such cases, even currencies inferior to the official currency can gain acceptance due to lack of alternatives (e.g. private currencies issued by employers in remote locations lacking access to official currency). The second case is where CCs can claim exclusivity over specific trades due to various reasons. The currency issuer is a sought after contracting party, accepting only her own currency in payment for goods and services she offers (for example, in-game currencies sold to users by producers of popular computer games); advantages of cost and/or convenience over official currency in certain transactions (for example use of Bitcoin for small denomination online payments and purchase of illicit goods). So CCs seem (at least temporarily) successful in episodes where the official currency is suddenly unavailable in cash, where it is not applicable at all towards the trades concerned or its use is entangled with disadvantages in the transactions concerned. But as the modest success of LETS shows, they fare far less well when exposed to competition with official money.

Why is that? Returning to the functions of money introduced above, we can expect a good currency to exhibit the following features: a unit of account that covers the broadest possible range of commodities and contracts, thereby enabling consumers to compare prices to get the best deal. That is a central reasoning behind the introduction of the Euro as common currency for the European Community's common market; prices in Spain and Finland can now be compared without having to confront conversion rates, conversion costs and fluctuating exchange rates.

Concerning the means of payment and store of value function, we can expect users to choose a currency which is as widely accepted as possible, and which can best be expected to keep its value over time, making it also the most liquid store of value (at least for short periods of time).

The features described above imply that, if several currencies offer the same access to goods and services, it would be inefficient for users to use all or many of them in parallel unless they can be considered perfect equivalents (sharing the same unit of account and credibly keeping par relationship among each other). If different currency issuers offer different units of account, currency competition will ensue. If faced with a choice between competing currencies, a currency user has to form expectations about the behavior of two (groups of) actors, the issuer and other users. Currencies can be conceived as networks comparable to telephone networks – the benefits of using a specific currency for each individual grows with the service quality of the network and the number of participants. If one among several competing networks of comparable quality succeeds in reaching a critical mass of initial users, they will soon achieve a position that is very hard to contest by competitors. If there are competing value standards, we can expect people to prefer the standard which holds its value over at least shorter periods of time and which covers the most (and the most attractive) goods and services. The possibility and credibility of the issuer to assure the quality of a currency, and the likelihood of other users adopting it are therefore decisive features in currency network competition.²¹

21. Benjamin Cohen, *The Future of Money*, Princeton: Princeton University Press, 2006, p. 11.

The Role of the Issuer

The issuer can promote the acceptance of its currency by offering contracts (concerning goods, services or liabilities) in high demand among potential users against payment of its own currency, and by credibly promising to stabilize the purchasing power of the currency over time.

How is the stability of money's purchasing power assured? Money issuers have used different mechanisms to signal a commitment towards future stability. The choice depends on the available options and various political economy considerations. Historically, in uncertain times characterized by war, shifting political authorities and general mistrust, precious metal has been used as the monetary base. In the 20th century, after the consolidation of national states and currencies, and the democratization of states, it has been possible to decouple the issuance of money from metal backing. Checks and balances against irresponsible monetary practice now seem in many cases to be sufficient to stabilize expectations that ensure trust in unbacked currencies. That was considered a welcome development, because stabilization of purchasing power in a dynamic economy characterized by permanent change requires permanent adjustment by the issuer. Under such circumstances, tying currency issuance to some scarce metal has inconveniences. It takes away the flexibility to adjust the means of payment to the needs of a growing economy. Without that restriction, stability with respect towards metallic reserves in the vault of monetary authorities makes way for the more useful notion of stability with respect to the evolving development of the economy, i.e. stability in terms of purchasing power. Such stability can be expected over the short term only, though. Over the longer term, rarely any currency in the 20th century has kept constant purchasing power. This is not a defect, because a functioning economy is not well served by too much encouragement for storing wealth in cash over longer periods. Instead, it requires people to invest their savings either directly in business enterprises or indirectly via financial intermediaries in order to stimulate economic activity. So over the long term, inflation must be low enough to prevent users from searching out alternative currencies, and high enough in order to encourage the accumulation of wealth by investing instead of hoarding cash.

In industrialized countries, central banks steer the provision of cash and its electronic substitutes by the financial system according to public mandates. The ability to stabilize complementary currencies depends on their issuing principles. In regional currency arrangements, issuing 1:1 against official currency is common. In mutual credit clearing arrangements, credit is issued in the process of exchange against supply of goods and services. Other concepts envisage backing by natural resources. In order to assist in stabilizing their currency's value, many complementary currency issuers try to restrict the formation of a private market where units of complementary currencies could be sold at a discount against official currency. The disadvantage of such a restriction is that the lack of ability to get out of the currency can deter potential users to get in, in the first place. The concept of Bitcoin is different. Based on a unit of account without any stable reference towards another currency or some sort of backing, its supply is subject to an arbitrary upper limit to be reached over time. When the number of users grows, its value in terms of other currencies can be expected to grow – that's the signal Bitcoin wants to send to potential users in order to attract them. The currency's purchasing power is completely determined by supply and demand in

private currency markets. The resulting volatility of its exchange rate with other currencies makes for an interesting speculative object, but is detrimental for being used as unit of account and means of payment, two of the central functions of money.

Many CCs offer design features that depart from those of established currencies, and which would become operational once CCs are in circulation. The problem is that many such features (e.g. automatic loss of value over time, limited acceptability etc.) prevent such CCs to become accepted by users in the first place. While Bitcoin is quite unique among CCs in having strong features to attract users (i.e. the promise of value appreciation), its design is oblivious to the fact that precisely these features make its use as money unattractive.

Sharing the same unit of account with the official currency can increase chances of a CC's acceptance (because it then benefits from the price system established under the main currency). Convertibility with the official currency also does (because having the exit option reduces the odds of entry for users), but limits autonomy in issuance because the latter has to operate under the constraint of keeping par relationship with official currency. The issuer must be able to always redeem the CC in official money 1:1. Still, issuers of payment media in the official unit of account must offer some advantage to users in order to actually get acceptance. For instance, paying by bank deposit transfer instead of cash offers advantages in large value payments (because the alternative – carrying around a suitcase full of cash – is inconvenient and risky) and in transactions where buyer and seller do not physically meet.

Having a different unit of account than the official currency (like Bitcoin does) creates barriers between currencies, as their exchange rate can be subject to significant fluctuations. The risks associated with the latter feature is a user deterrent unless the CC's unit of account can lay exclusive claim on sought after commodities.

What Currency Users Expect

Apart from the issuer, the behavior of other users is decisive for individual decision making about whether to accept a certain currency. Will I be able to spend the money received for something I want to buy at a later date? Only if an individual user can expect that a significant number of her potential transaction partners will accept that currency for payment of goods, services and liabilities, she will be prepared to accept that currency herself.

Among users, some are more important than others. Users offering contracts in high demand by other users make a more significant contribution to the attractiveness of the network than others when switching to the network's unit of account. If one grocery shopkeeper accepts a certain currency in payment, that is a higher contribution to the attractiveness of the currency in question than acceptance of ten of my neighbors who have no specific supplies to offer. In other words, a network's attractiveness consists in the kind and range of goods, services and debt contracts it allows access to, and the conditions under which a currency offers this access (i.e. evolution of purchasing power, and transaction costs related to making payments in that currency).

The modern state is in most cases successful in issuing its own currency and having it accepted, not due to its monopoly of force, but because it is usually the single biggest

economic entity in the economy and it collects taxes on economic activity to finance public services. By accepting exclusively the sovereign currency in tax payments, states create a substantial demand for their own money. If a shop owner has to pay her taxes in Euro, she will likely want to be paid by her customers in Euro. And by being a significant player in the national market (by employing people in public administration and contracting public works), the state creates a lot of income within the population paid in official currency. These factors are likely to create a critical mass of currency users, which is decisive for the development of network effects. Even for people that are initially free from tax obligations, the establishment of an initial network of taxpaying state currency users can make joining the network attractive. Because taxes are usually paid on economic activity, the tax-initiated network is at the same time a network consisting of attractive suppliers of goods and services: you can only tax when there is production and trade going on among citizens.

Elements of Monetary Networks

By relying on network effects, the state establishes its unit of account as the standard measure of value in the economy. All the prices for goods, services and debt contracts will be denominated in the official currency. It also issues coins and notes (usually via the central bank and mint) that function as means of payment in economic transactions and discharge of debt obligations.

With respect to means of payment, the central bank and mint are not the exclusive issuers. Balances in bank accounts are claims on money, which can be used instead of cash in payments among citizens. The balances resulting from the transfer of credit among banks on behalf of their customers are settled in central bank money. As long as people's cash needs stay within usual limits, banks can operate payments, grant credit and incur liabilities in the form of checking and saving accounts while holding only a fraction of their balance sheet in cash. In order for this system to be stable, banks have to make sure that the public's trust in their ability to convert balances in deposit accounts into cash, i.e. to fulfill claims on money held by the public, is upheld.

In a way, the use of bank deposits as means of payment could be considered a complementary currency. But its relationship to central bank money entails a peculiar hierarchical feature. By being a claim on money, bank account balances are denominated in the official unit of account and must be managed by banks with a view to keep par relationship with central bank money. Banks usually offer depositors interest rates as compensation for the risk involved in parting with cash, the most liquid form of value. Deposit insurance and eventual crisis back-up by state institutions assist in maintaining the promise of par relationship. In turn, banks submit to regulation, supervision and are subject to monetary policy operated by central banks. When trust in banks evaporates, customers may start to doubt whether their deposits are still of equivalent value to money, and reject banks' means of payment. A run on the bank's cash reserves can ensue – customers try to exercise their deposit claims on cash in huge numbers, eventually surpassing the cash reserves of the bank concerned and bringing it down.

The ability for credit to act as money substitute is not restricted to credit issued by banks. For instance, inter-company loans such as trade credit granted among firms

represents a significant part of the liabilities of the industrial sector.²² When firms issuing liabilities have good reputation, their debt might even circulate as means of payment among other firms.

But among credit forms, bank credit is the most developed one. Banks specialize in collecting and assessing information about creditworthiness of all kinds of borrowers. By pooling the resulting promises to pay and being subject to regulation and supervision, bank liabilities usually enjoy the highest degree of trustworthiness among credit forms, ranking highest among other money substitutes in the hierarchy established by the prevailing unit of account. The issuers of credit claims promise full payment of the nominal amount in official currency, and try to establish a reputation by repeatedly making good on that promise.

Deep political and economic crises often entail monetary crises. In such a case, the arrangements in place for keeping the promise of value stability are shattered. If instability surpasses a certain threshold (e.g. in episodes of hyperinflation), users can be induced to look for alternatives. In many economically weak countries in economic history, currency substitution has taken place. Would such a deteriorating performance pose a chance for rivaling CCs based on private initiative? The answer tends to be no. Usually, substitutes are almost exclusively chosen from among the rank of other state supported currencies.²³ Private CCs are inevitably positioned at the bottom of the hierarchy of credit claims. In a situation of eroding trust in the national currency at the top of the domestic credit hierarchy, users usually try to exchange national currency for a currency further up the international hierarchy, not a private one of lower hierarchical status. Bigger existing networks and a more credible stability track record are what typically attract users. Therefore, we can observe 'Dollarization', 'Euroization', etc. in small countries suffering from lack of public trust in their official currency, instead of a spread of private start-up currencies.

Conclusion

The criteria of capitalism and the criteria of democratic civil society often clash. There are segments in the economy, which are not appraised by the market despite being considered a useful contribution to public welfare by many members – care work and art are just two. Some regions experience economic distress that triggers social crisis. Time and again, the whole economy experiences crisis, which leads to hardship among the population. Poor groups are permanently disadvantaged by the inequality resulting from the normal operation of markets. The traditional solution for such tensions is taxing market income and wealth or incurring government debt, and using the proceeds to finance government transfers to correct market outcomes considered incompatible with democratic will. The distributional issues involved in such measures can lead to a thorny political process hindered by tax resistance, divided opinion about what is to be considered of public value etc. Could a complementary currency provide a short-cut towards an alternative solution, offering a route for a minority to express value appraisals differing from those of the rest of society?

22. Task Force of the Monetary Policy Committee of the European System of Central Banks, 'Corporate Finance and Economic Activity in The Euro Area', Structural Issues Report 2013, *ECB Occasional Paper Series* 151 (2013): 7.

23. Cohen, *The Future of Money*, p. 25.

Complementary currencies can work if they are able to provide exclusive access to certain transactions (or exclusive benefits in relation to such transactions like discounts or anonymity) with respect to their content, their location, their size or the transaction partners, provided there is sufficient solvent demand for such transactions.

Absent such attractions, keeping a CC in use requires measures to decouple community members from the rest of the economy, which goes beyond the mere introduction of a currency. But even in that case, alternative economic circuits revolving around CCs will need official currency to pay for taxes and at least some imported commodities from the outside world. This requirement entails difficult choices involving the means of acquiring outside currency and managing the implications this has for the loyalty of CC community members and the management of exchange rates with the official currency. Because decentral entities issuing complementary currencies usually lack powerful instruments like capital controls, legal tender laws or taxing authority, they must either attract voluntary users with economic features that prevail in competition with official currency, or they must induce people to substitute individual economic motives by collective values enforced by peer pressure or non-economic benefits.

Of course, community members can choose to adopt complementary currencies despite their failure to prevail in competition against competing currency networks according to purely economic criteria. Whether such non-economic motives can prevail over economic advantages of joining official currency networks is an empirical question that cannot be settled once and for all. But it has to be kept in mind that enforcement mechanisms to foster community participation can gain a repressive character beyond a certain limit. And while social and community building effects may be considered successful features of complementary currency projects which go beyond economic aspects,²⁴ possible disputes among network members over valuation standards, distribution of benefits and governance issues are also part of the reality of CCs which have to be included in any assessment.

Transregional monetary networks are an expression of advanced societal division of labor in capitalism, governed by profit expectations. They can bring advantages in terms of profit making, specialization, efficiency and quality improvements. But they also entail transregional dependency of people across the globe from each other, which is especially felt in crisis. The autonomy of any economic project that does not completely decouple from this global division of labor can only be relative.

If currency areas are not congruent with the division of labor, local currency users who want to benefit from the translocal system are faced with costs (for exchanging the currency, coping with exchange rate risk, etc.). The smaller these currency areas, the more pronounced these costs. All people hoping to benefit from the wider system will try to avoid that cost.

If a currency circulates within a stable network of users, monetary policy is possible by the issuer, which has a bearing on economic activity. But issuing a complementary currency is not an instrument able to force the economy to work according to

24. Axel T. Paul, 'Die Legitimität des Geldes', *Leviathan* 21 (2002): 109-129.

different rules. The capitalist economy works based on competition among unequal private property owners, resulting in production, transactions and wealth accumulation accounted for and paid in money. The supply of money can have effects on these processes, but on its own it is not a means to alter their logic.

Some CC projects are based on the hope that a different currency can stop the growth of inequality, thought as being triggered by the accumulation of money and the alleged tendency of money to grow through the compound interest mechanism.²⁵ But such an approach rests on the conflation of money and wealth. Wealthy people do not hoard cash or bank accounts to a large extent.²⁶ The primary form of wealth in capitalism is business ownership and income derived from owning or managing firms, as well as housing property and various financial assets. None of these are touched upon by reforming money. Inequality is not the result of monetary distortions of the market but of its normal functioning, assisted by a very benign tax treatment of wealth and its private transfer among generations. This wealth is the result of profit-oriented production based on private property and free labor, organized by competition on markets. Money symbolizes, measures, stores, and transfers wealth. Manipulating or reforming money does not yield an economy based on different principles. The expectation that through reformed money, the market would turn into a neutral forum of exchange among independent, small and equal individual producers is subject to disappointments.

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25. Greco, *The End*, p. 2032.

26. Thomas Piketty, *Capital in the 21st Century*, Cambridge, MA: Harvard University Press (Kindle Edition), 2014.

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FINANCIAL CAPITAL AND THE MONEY OF THE COMMON: THE CASE OF COMMONCOIN

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On the 21st and 22nd of June 2014, just a few months after the MoneyLab conference in Amsterdam, a group of researchers and militants including the authors of this article met at the social center Macao (located in the ex-slaughterhouse of the city of Milan) to discuss different ways to implement a new cryptocurrency, which was later named 'Commoncoin'. The Macao workshop was just one in a series of events to take place across Europe in 2014. The events included (among others) the workshop on Algorithms and Capital hosted by the Digital Culture Research Unit at Goldsmiths College in London¹; the launch of D-Cent, a European research project on complementary currencies²; the MoneyLab conference in Amsterdam³; and the workshop of the Robin Hood Minor Asset Management Cooperative in Stuttgart.⁴ These events took place against the background of the possibilities opened up by the success of Bitcoin, but also against the pressure of the ongoing recession and the austerity policies imposed by the European Central Bank after 2008, dictating to countries such as Greece, Portugal, Spain, and Italy structural adjustment policies already familiar to Asian and African nations since the 1990s. In such a way, the financial crisis of 2008 was turned into the occasion for the imposition of an ever more intensive precarization of labor compounded by drastic cuts to public services opening the way to privatization and a re-structuring of the Welfare

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2. See <http://dcentproject.eu>.
3. Jerome Roos, 'In Each Other We Trust: Coining Alternatives to Capitalism', *Roarmag.org*, 31 March 2014, <http://roarmag.org/2014/03/moneylab-conference-alternative-currencies/>.
4. Pekka Piironen and Akseli Virtanen, 'Democratization of Finance: An Interview', *Robin Hood Minor Asset Management*, <http://www.robinhoodcoop.org/pages/democratization-of-finance-an-interview>.

State into a Workfare model.⁵ These European meetings thus expressed a specific, situated response to a global process of financialization, looking at the changed nature of money and capital while also considering whether an alternative financial circuit could break the hold that the financial oligarchy exercises on our hopes and lives.

Rather than hoping for a return to the 'real' (Fordist) economy against the 'false' economy of finance, the meeting in Milan drew on theoretical arguments, which emphasized the structural importance of finance to a global economy where the extraction of surplus value is generalized to the whole of society while labor as such assumes an affective, cooperative, and cognitive dimension.⁶ From this perspective, financialization is considered as the answer of capitalism to the urgency of creating a new dispositif of accumulation given the centrality of the network as a mode of logistical organization and patterning of social cooperation. As the division of labor in the factory and the distinction between productive and reproductive work is supplemented and displaced by social cooperation as the main source of value, the political concept of the common identifies a new political platform beyond public and private, state and market.⁷ The capability of finance to express the value of such cooperation through a form of money which is not simply exchangeable into commodities but which has the power to shape the future(s) is a crucial stake in new forms of struggle, which envelop and exceed the terms of the older workers' movements. Labor performed for a wage within given times and spaces (factories, offices), and organized by entrepreneurs and managers, is only a part of a larger pool of value-creating activities. These activities know no difference between work and leisure, paid work and free labor and depends on extensive socialization and circulation of ideas, percepts, and affects. At the meeting in Milan, we started from the notion that the common – that is the pre-and trans-individual potential which we draw onto and create when communicating, talking, listening, making, designing, calculating, caring for each other and for the earth, bringing up children, making music, film, etc. – is the ontological basis of the production of wealth and social life as such. By privatizing gains and socializing losses, financialization both expresses the importance of the common as source of value – the dire consequences of financial capital as a dispositif of accumulation – and the possibility of financial institutions of the common nurturing and nourishing that financial capital depletes.

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5. Tiziana Terranova, 'Social Unionism and Digital Labor in the Transnational Space of European Austerity', *Euronomade*, <http://www.euronomade.info/?p=3416>.
 6. For further reading see: Christian Marazzi, 'Summer School: La moneta del comune', *Uninomade* 2.0, 13 September 2012; Cristina Morini and Andrea Fumagalli, 'Life Put to Work: Towards a Theory of Life-Value', *Ephemera* 10.3/4 (2010): 234-252; Cristina Morini, *Per amore o per forza. Femminilizzazione del lavoro e biopolitiche del corpo*, Verona: Ombre Corte, 2010; Carlo Vercellone, 'From Formal Subsumption to General Intellect: Elements for a Marxist Reading of the Thesis of Cognitive Capitalism', *Historical Materialism* 15.1 (2007): 13-36; Maurizio Lazzarato, *Les révolutions du capitalisme*, Paris: Empêcheurs de Penser en Rond, 2004.
 7. David Bollier and Silke Helfrich, *The Wealth of the Commons: A World Beyond Market and State*, Amherst, MA: Levellers Press, 2012; Andrea Fumagalli, 'Twenty Theses on Contemporary Capitalism (Cognitive Biocapitalism)', *Angelaki* 16 (2011): 7-17; Michael Hardt and Antonio Negri, *Commonwealth*, Cambridge, MA: Belknap Press, 2011; Cristina Morini, *Per amore o per forza. Femminilizzazione del lavoro e biopolitiche del corpo*, Verona: Ombre Corte, 2010; Andrea Fumagalli, and Stefano Lucarelli, 'Cognitive Capitalism as Financial Economy of Production', in Andrea Fumagalli, Carlo Vercellone and Vladimir Cvijanovi (eds) *Cognitive Capitalism and its Reflections in South-Eastern Europe*, Frankfurt: Peter Lang, 2010; Christian Marazzi, 'Summer School: La moneta del comune'.

At the Milan conference, organized by Effemera Network (born, together with the Euronomade network, after the dissolution of UniNomade 2.0), the focus was on the idea of a new cryptocurrency aimed at the circuit of Italian occupied theatres, at the movements of precarious workers, at the network of social centers, but also at the larger alternative economy circuit including farmers' movements against seed patenting and others. At the end of the meeting the new cryptocurrency was named 'Commoncoin' and a model was developed which started from the Bitcoin protocol, but introduced some elements of novelty. The first point of deviation was the statement that the 'Commoncoin' aimed to contribute to the invention of an alternative economic system as a form of finance/credit money able to remunerate social cooperation and the work performed by the general intellect. Functioning against the widespread logic of unpaid and voluntary work, a Commoncoin should be able to finance new forms of welfare (commonfare) based on unconditional basic income hypothesis and free access to common goods. The idea was raised of an alternative form of money that generates a production of use-values rather than functioning as a medium of exchange-values. The second point of departure was in the consideration that the objective design of the Bitcoin protocol should make space for the inclusion of a subjective and social element in money creation by possibly deploying the technologies of the social internet. The mood surrounding the event was one which posed, against the dire backdrop of austerity and debt, the possibility of an historical opportunity enabled by the total dematerialization of money after the collapse of Bretton Woods and the rise of finance money as 'pure sign', without any form of control by state monetary sovereignty.

The notion that 90 percent of money in circulation exists already as a digital signal encoded in networks of computers can produce a kind of neo-Baudrillardian interpretation of virtual money. As sign without referent, virtual currency could be understood as the final colonization of the real economy by a hyperreal domain of speculation – a pure simulation. The notion of a bad, fake financialization opposed to the real economy is contested both by activist anthropologists of the financial world⁸, but also by post-workerist Marxists who, as we have seen, consider financialization as the answer of capital to the crisis of measure – that is the inability to measure productivity on the basis of the labor theory of value. Financialization has a potential: it reveals how money can function as an invention and that it can also account for different ways of organizing the production and distribution of wealth, which is alternative to both socialism (state) and market (capital). Financialization makes us also think of the potential for monetary production to be designed in such a way as to enrich not only the few (communism of capital), but the many (the communism of the common).

The notion of something like a 'commoncoin' for the network of occupied spaces in Italy is just one of the examples one could point to in the veritable proliferation of digital currencies which has characterized the early 2010s (such as Litecoin, Ripple, Bitcoin). Most of these cryptocurrencies have copied, forked or innovated Bitcoin, the first one to attract the attention both of stock markets and mainstream media. Discussions around the best way to encode and implement a cryptocurrency such as Commoncoin emphasize how the design of a cryptocurrency expresses not simple technical choices

8. Brett Scott, *The Heretic's Guide to Global Finance: Hacking the Future of Money*. London: Pluto Press, 2013.

aiming at maximizing efficiency, but also value systems. To use the most common example, Bitcoin emerged out of the hacker community energized into action by the so-called WikiLeaks financial blockade. This saw the whole financial infrastructure of the internet (PayPal, Visa, Mastercard) mobilized against Julian Assange and his team of cypherpunks under the lead of the U.S. government. Bitcoin encodes the core values of the libertarian cypherpunk society: a rejection of state control and of the dominion of large corporations; the endorsement of anonymity or at least pseudonymity; the deployment of a peer-to-peer architecture with no central control; and a distrust of subjective relations which aims at minimizing the human and social element by means of objective mechanisms.

The question that the larger cryptocurrency movement poses, however, can also be framed in these terms: can other sets of values be encoded in a cryptocurrency beyond those expressed by the Bitcoin protocol? How can different communities, collectives, and assemblages engage with the process of virtual currency creation? In the case of Commoncoin, the question was further specified: can we conceive of not just a single cryptocurrency, but a whole cryptocurrency network as an aid and a tool for an alternative mode of production? The economists present at the Milan meeting brought a strong argument to the workshop: with the transition from the hegemony of Taylorist-Fordist capitalism to cognitive and financialized bio-capitalism – the main function of money has changed. The credit function was typical of the previous phase, where the 'M(oney)-C(ommodity)-M(oney)' circuit (the monetary production economy) provided liquidity to invest in the production of goods by means of a monetary anticipation causing the indebtedness of economic actors (either private firms or the state). What we are facing today is a transition from credit money to financial money that coincides with the total dematerialization of money, which thus becomes pure sign money. What makes the cryptocurrency movement possible and important is the transition from credit money, which is issued under the control of monetary institutions (such as Central Banks) to finance money, which depends on the social dynamics of the oligarchy of the financial market.

For theorists of cognitive capitalism, money, and the determination of its value is thus no longer under the control of Central Banks (even as specific central banks such as the ECB and the Fed might implement different strategies). At the very moment when money becomes pure sign money, it escapes any public scrutiny. Money loses the status of 'public property good' and its value is determined moment by moment through the operations of the speculative activity in financial markets. Its functions as means of payment and unit of account (measure of value), as well as a store of value and means of finance accumulation, escape control. At a time when its quantity and mode of issue are determined by the conventions that dominate an increasingly concentrated financial system, money becomes hostage to the expectations that the oligarchy (or rather, the dictatorship of the oligarchy) of the financial markets is able to exercise.

Today, we can say that the creation of finance money is the expression of the libertarian communism of capital. Money is, thus, an expression of financial bio-power, since its value is determined by the financial conventions, whose governance represents a proxy of the expropriation of the common, as the new form of capital-labor exploitation in cognitive biocapitalism. The question becomes: can a network of cryptocurrencies, once freed by institutional constraints, become part of a larger assemblage able to

carry a counter-attack to the oligarchy of large financial intermediaries? In other words, can the cryptocurrency networks, even when they play the role of store of value (as in Bitcoin), avoid being subsumed by the traditional financial system? Can they contribute to emancipation and not subsumption; be an alternative and not merely another compatible module? The new cryptocurrency movement will have the difficult task of connecting to a larger movement capable of overturning those relations of forces, which have produced financialization as 'revolution from above', and turned labor into a commodity whose cost is ever closer to zero. Can cryptocurrencies contribute to the creation of what Christian Marazzi has called a 'money of the common', that is a 'money that gives expression to and acknowledges what is common to a multitude... in a political, social and demographic space?'⁹

If conceived as alternative to the monetary and financial production economy, Commoncoin could be used at first as complementary monetary payment of labor-force, able to increase the wages, paid in traditional money, but also finance a basic income as primary income, able to remunerate the entire life put to labor and, hence, to value. A money of the common (of which Commoncoin constitutes an experiment) could re-create a different economic circuit, in which material and immaterial production is no more financed by the credit market. And the simplest way is, from this point of view, to imagine a sort of common financial institution, able to generate money according to the logic of social cooperation, which is irreducible and irreconcilable to the traditional financial hierarchies. In other words, we need a tool, or better, more tools able to favor the reappropriation of the Commonwealth that we all contribute to generate.

Unlike even heterodox economists such as Robert Shiller and André Orléan, Marazzi insists that money-creation does not dissolve into a pure mimetic space, but expresses somehow the 'substance' of social cooperation and its main product: the Commonwealth as the expression of the biopolitical existence of human beings. In the extractivist mode of accumulation which for some characterizes contemporary capitalism, this money flows into the hands of the financial oligarchy as insurance and pension funds, mortgage and loan payments, national debts interests, profit enabled by the privatization of the institutions of welfare, and the commercialization of data generated by use in the mode of peer production which are now added to the traditional extraction of surplus work from waged labor. The Common is composed by the vital and cognitive faculties of human beings, from knowledge to the body, from relations to sensations, from language to movement, from sensuality to thought: a production of surplus that derives from the mere fact of existing. As Brian Massumi has recently put it, the economy can be seen to rest on the groundless ground of 'bare activity'.¹⁰ In its two main articulations (the re/productive and the cognitive commonwealth), the common is the basis on which the process of *subsumption* of life under capital in the age of cognitive-biocapitalism is articulated: it is a source of absolute, as well as of relative surplus value. Appropriation of the Commonwealth thus means the appropriation of the relative and absolute surplus value generated by the subsumption of life, pointing to the necessity to go beyond the capitalist stage

9. Christian Marazzi, 'Summer School: La Moneta del Comune'.

10. Brian Massumi, *The Power at the End of the Economy, Art Beyond Interest, Joy Beyond Reason*. São Paulo and Helsinki: n-1 Edições, 2014.

towards new form of organization of existence. From this point of view, the money of the common together with the concept of welfare of the Common (Commonfare), irreducible to process of managing and supplying common goods, is a revolutionary proposal.

If money can be designed, it is argued, it is because the general intellect has evolved and can thus perform not just exchange but also finance. Within the current forms of scriptural, financialized money, it is possible to glimpse the possibility of a currency sustaining an anthropogenetic economy based on a post-socialist form of welfare. A new ecology of money able to perform different functions and feeding the common rather than exhausting it will need algorithms and peer-to-peer networks (Bitcoin innovation) but also social plug ins, tagging, comment boxes, and algorithms working on social quantities (entropic data); it will express a different kind of subjectivity and social values of a larger population than the one of brokers, traders, investment fund managers, hedge funders and such likes. It will break with the notion that human beings are profit-maximizing individuals and open up to a multiplicity of values and interests that humans hold because they are social beings; associative creatures who cannot but live in societies, who develop bonds, who need the company, conversation, and support of other humans, and hence are dependent on a variety of elements (natural, technological etc.) to sustain and reinvent their existence.

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HEAT EXCHANGES

FINN BRUNTON

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Hot Bits

This is a story about two beautiful abstract entities awkwardly struggling to exist in the constraints of the actual universe. These entities are called *money* and *the wire*. Like Gnostic forces, they are the crude form of what they could be, haunted by their other forms: perfect information, permanent value, lossless transmission. You've almost certainly already encountered them today before reading this. What follows is a history of how they met in the genesis of cryptocurrencies, and what they can tell us about how computers compute and how money holds value – about how they draw strength and solidity precisely from their friction-laden failure to live up to our models.

Starting with the wire: singular, because it is as free of individual peculiarities and distinguishing characteristics as one Platonic sphere from another, as exact as an axiom. The engineer and scientist Danny Hillis, part of the team that produced the massively parallel supercomputer the Connection Machine, describes the wire as a 'costless and volumeless idealized connection'.¹ You put data into one end of the wire, and the data appears in one or many other places. It is instantaneous, it is cheap, it is tiny, and it dissipates no power. It can be ordered from the same catalog as the frictionless boards and massless pulleys of introductory physics. It is fantastically useful for thinking and design, but sadly it must share our universe with us. Wire transmission can therefore be as good as instantaneous – but it will still take a bit more than three nanoseconds under ideal conditions for a signal to travel a meter. Factor in less-than-ideal media, and handoffs, interchanges, and switching systems, and you can produce one of the earliest and still most beautiful 'phone phreak' hacks: routing a call from relay to relay around the planet all the way back to another line in the same room. Two phones sit on a table, and when you speak into one your voice comes out of the other after a brief delay, making the Earth into your Echoplex effect pedal.² The wire is instant, but wires take time, however little. Wires cost, however cheap, and occupy space, and they must dissipate power – which means generating heat.

As a practical matter, the work of computation is the work of managing heat. The history of computing is also a history of air conditioning and temperature control. Start when you like: Charles Babbage discovered that the gears of his programmable, calculating Difference Engine generated enough friction to challenge the limits of Victorian-era

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1. William Daniel Hillis, *The Connection Machine*, PhD diss., Massachusetts Institute of Technology, Cambridge MA, 1985.
 2. Ron Rosenbaum, 'Secrets of the Little Blue Box', *Esquire Magazine*, October 1971.

tooling technology, in the effort to avoid ‘all possibility of derangement in the machinery’,³ and therefore of the results it produced. In early electrical computers, the challenge of keeping the results of a given computation in working memory – available to be fed back into an ongoing process – resulted in the marvelously improbable solution of *delay line memory*, which used the propagation of a circulating wave as the equivalent of repeating a phone number over and over to yourself as you hunt for a pen with which to write it down. Of course, for this to work, you had to know reliably how long it would take a wave you’ve sent out to come back, which means having exactly the right fluid at exactly the right temperature. Getting things in time, for computing, means having them in space, with a clear picture of the speed of sound: therefore tubes filled with glittering mercury were wrapped in coils keeping them at 40 degrees centigrade, storing hot and noisy bits. (UNIVAC I had pulses of sound set aside to confirm that travel at the right speed was happening, to correct the temperature accordingly – a thermostat that used time as a picture of space, which was in turn an index of heat.)⁴ ‘Noisy bits’, literally: many sources of inaccuracy or noise, like reflections off the interior of the tube, had to be accounted for, and the delay line pipes themselves were nice and loud, a rattling click track for the operation of an algorithm.

Over the years the source of the noise shifts from discrete to continuous, from the distinct waves rolling through the hot mercury to the roar of the air conditioning, the sound of computational work being done. Moving current through a conductor results in Joule heating, collisions between electrons and atomic ions giving off kinetic energy – an amount of heat proportional to the square of the current. Illustrations of this abound, most obviously in the warm glow of an incandescent light bulb, whose filament shines with resistance to the current passing through it. Heat pours out of the digital machines built with vacuum tubes, akin to light bulbs, whose on-ness or off-ness holds the state of a computation; EDVAC had more than 3,000 tubes, and needed an air conditioner that consumed about half its power.⁵ In the Princeton summers, attending to the ENIAC machine – with its special refrigeration units because it ‘ran very hot’,⁶ constantly failing – was like working in a ship’s furnace, and the gunk messing up the IBM punch cards was tar that had melted and dripped down from the roof. Air was blasted over the mechanism at 4,500 cubic feet a minute and the humid atmosphere of New Jersey iced over the coils.⁷

‘Big iron’, the massive mainframe machines that stood apart from early personal computing – stood, indeed, like plinths or menhirs, full of complex engineering and design choices to maximize processing power – had to be embedded in a *thermal architecture* capable of sustaining their operation. The IBM 704 (still with vacuum tubes, now featuring floating point operations) was the computer used for the voice synthesis experiments that inspired the demise of HAL 9000 in Kubrick’s *2001: A Space Ody-*

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3. Unsigned obituary, ‘Charles Babbage, Philosopher’, *Van Nostrand’s Engineering Magazine*, October 1871.
 4. Sperry Rand Co., *UNIVAC I Maintenance Manual For Use With UNIVAC I Central Computer*, sections 1-75 to 1-99, New York: Sperry Rand Corporation, 1956.
 5. M.D. Godfrey and D.F. Hendry, ‘The Computer as von Neumann Planned It’, *IEEE Annals in the History of Computing* 15.1 (1993): 13.
 6. Charles Schrader, *History of Operations Research in the United States Army, Vol. I 1942-1962*, Washington D.C.: CMH Pub 70-102-1, 2006.
 7. George Dyson, *Turing’s Cathedral: The Origins of the Digital Universe*, New York: Vintage, 2012.

sey, whose melancholy song is carried on in eerie quiet, presumably because HAL could vent waste heat to space.⁸ The actual 704 needed an air conditioning apparatus rumbling away: the machine installed at RAND had an entire under-floor plenum devoted to pumping cold air up through the cabinets, over the tubes.⁹ The 704 at MIT had air conditioning failure alarms, so engineers could come sprinting in, like emergency room doctors in a TV drama, to yank panels off the box and keep the patient from overheating.¹⁰

As the transistor and the integrated circuit condense these room-sized architectures into the thumbnails and postage stamps of chips, microscopically etched with photolithography, this problem becomes more extreme: the chips now have to get heat out of themselves, out of their envelopes of ceramic and plastic, and then the machine that encloses them must in turn do something with it. Moore's Law means the number of transistors that can fit on a chip doubles every eighteen months, and each doubling is another threshold of power dissipation to be crossed. The first Cray – a supercomputer for scientific projects that required processing huge volumes of data (Las Alamos National Laboratory got the test machine with serial number 001), developed by a team led by Seymour Cray – was a masterpiece of heat management. It used high-speed integrated circuits set back-to-back on sheets of copper mounted on tubes of Freon, the now-restricted refrigerant gas from DuPont, working like the coils of an air conditioner.¹¹ The center of each 'module', the stack of circuit boards, could never get above 65°C, which meant the plates, bars, and refrigerant system were connected to two twenty-ton compressors outside the computer room. Construction delays rested on getting the pumping system right; all the patents for the original Cray-1 were for innovations in cooling. The cool, ice blue, virtual world of *Tron* – parts of which were rendered on a Cray-1 – rested on a vast cloud of searing hot air.

This heat became part of the everyday practice of personal computing, signaled by the moment you hit the key command to save a Photoshop file and the program lurches, hangs, and suddenly the fans kick on. PC gamers running high-end graphics began building hot-rod boxes with fans like turbines, the parts assembled inside refrigerators with the gleaming edges of the components softened by the fog of condensation on the exterior glass. Gamers wanting laptops can buy or build custom machines, like Christian Sandvig's *Sager Notebook*, with a motherboard plated in copper. When the system switches to the powerful desktop graphics card, '[t]here is a sound like a jet engine starting up and the person sitting to my left is from then on continuously bathed in a stream of hot air'.¹² Or, like the sociologist danah boyd, people needing a lot of computational work in laptop form could burn their thighs and hope for a firmware upgrade.¹³

8. Geeta Dayal, 'Max Mathews (1926-2011)', *Frieze*, May 2011, <http://blog.frieze.com/max-mathews/>.

9. Willis H. Ware et al., *RAND and the Information Evolution: A History in Essays and Vignettes*, Santa Monica: RAND, 2008.

10. Steven Levy, *Hackers: Heroes of the Computer Revolution*, Sebastopol: O'Reilly Press, 2010.

11. James S. Kolodzey, 'CRAY-1 Computer Technology', *IEEE Transactions on Components, Hybrids, and Manufacturing Technology* 4.2 (June, 1981).

12. Personal communication with the author.

13. danah boyd, 'Blotchy Burns on My Legs from my Macbook', *Zephoria*, 9 September 2007, http://www.zephoria.org/thoughts/archives/2007/09/09/blotchy_burns_o.html.

The heat of computation is now, for many, less of a daily experience than before, but that isn't because the heat is a solved problem and the bits move without resistance. More and more of the heavy computational lifting is now exported to the cloud. The phones and tablets and netbooks can be as light as they are, and keep what battery life they have, by relying on the serious work being done elsewhere, in places like Sweden, Finland, and the higher latitudes of the Pacific Northwest, where massive server farms can be chilled by wintry air and geothermal power.¹⁴ Whether under the aurora or in a New York City summer in one of the AT&T buildings downtown, the server racks are arranged within their own thermal architecture of hot and cool aisles, a structure that ensures the steady flow of air, the highest possible cubic-feet-per-minute throughput, rushing like a river carrying heat away from the venting machines.¹⁵ Behind the chain-link, under the trunks of tagged and zip-tied ethernet cables, layouts of flowing air and carefully chosen temperature gradients have created an accidental version of Yves Klein's 'air architecture', in constant motion.

One of Seymour Cray's other patents concerns the use of a liquid from 3M called Fluorinert for immersion-cooling circuit boards: 'Unfortunately, that theoretically possible high density cannot be achieved in practice unless a very considerable amount of heat generated by such a high density assemblage of circuits can be successfully removed.'¹⁶ In Hong Kong just such a set-up exists, with an inert liquid (one in which electricity does not conduct, making it safe for computer components) boiling in tanks filled with ranked circuit boards. But the chips aren't cranking through climate models or rendering polygons for cinematic airships. They're solving a set of arbitrary challenges to produce hashes of data – that is, they're mining Bitcoin.¹⁷

Making Money Money

'Superdollars', said a Europol anti-counterfeiting officer, 'are just U.S. dollars not made by the U.S. government'.¹⁸ He was speaking of the counterfeit U.S. hundred called the Supernote, believed to originate from North Korea (likely cranked out on the excellent currency presses inherited from East Germany after the fall of Berlin Wall, where they'd served to fund the activities of spies in need of ready foreign currency). The Supernote is a beautiful production. Indeed, one of the very few ways that one run of the notes could be distinguished from Federal Reserve issue was that a few of the minute scenes were *too* perfectly rendered, with lines crisper and clearer than they ought to be, though even that was only visible to the best-trained currency specialists looking through loupes.¹⁹ It cuts to the heart of the strangeness of currency, to the multi-layered problem of trust. We trust that the notes we pass are real – to knowingly pass a counterfeit note is a crime – and that the body issuing the notes will not print too much money, and they will retain

14. Nicole Starosielski, 'Digital Media: Hot or Cool?', *Flow* 15.5 (January, 2012).

15. Rongliang Zhou et al., 'Modeling and Control for Cooling Management of Data Centers with Hot Aisle Containment', *Proceedings of the ASME 2011 International Mechanical Engineering Congress & Exposition*, November 2011.

16. Seymour Cray, 'U.S. Patent No. 4,590,538: Immersion Cooled High Density Electronic Assembly', United States Patent Office, 18 November 1982.

17. Xiaogang Cao, 'Visit of ASICMINER's Immersion Cooling Mining Facility', *Bitcoin Forum*, 25 November 2013, <https://bitcointalk.org/index.php?topic=346134.0>.

18. David Wolman, *The End of Money: Counterfeiters, Preachers, Techies, Dreamers – And the Coming Cashless Society*, New York: Da Capo, 2012.

19. Stephen Mihm, 'No Ordinary Counterfeit', *New York Times Magazine*, 23 July 2006.

their value more generally. We need confidence, and the notes must reflect this through a combination of security technologies and public assurance.

Thus currency is pulled from circulation when it starts looking shabby, and each note is embedded in networks of material scarcity and complexity that will enable it to meet the criteria of mints and central banks: that it be easy to produce and easy to verify, and very difficult to reproduce or to fake. There is a certain structural similarity here that will echo for those familiar with the P versus NP problem in computer science. There are classes of problems for which a computer can quickly determine whether a solution is valid, but which will take a long time for the computer to solve – so it can swiftly verify that a private key is the right solution to the problem that deciphers the encrypted message, but it would take epochs of time to arrive at the right solution itself. All the labor of currency work, with the reactive inks, security threads and special fibers, watermarks and holograms, is the work of making it so one institution can produce units by the millions, enough to keep not just a country but the international movement of trade flush with ready money, while another institution would find it difficult to produce a single such unit.

Of course, what makes money money is an enormously complex, abstract question that touches, at its deepest, on the foundations of human community and communication itself: on language, shared understanding, trust and everything contained in the concept of *exchange*. We could tell stories about cigarettes or beautiful snow-white slabs of salt on the backs of Bactrian camels on the Silk Road; we could cite trading networks of beads made from the pearl teeth of red deer around the Mediterranean basin about 46,000 years ago, or *World of Warcraft* gold.²⁰ But, for purposes of this essay, let's keep it simple. Money is what passes for money – that is, what you can pass in exchange for other things, and much, but not all, of what passes is a matter of sovereign decision. The sovereign, whether a monarch with a crown or the authority vested in a central bank by a representative government, has the right of mint and issue. They can do things like, in the case of the United States, make it law that a debt you owe can be paid by you in U.S. Dollars – your creditor cannot insist you pay it in euros, gold, or cocoa beans. They can police who is allowed to produce money that passes, and under what conditions. This work is obviously, trivially, about authority, but it is also about trust and confidence.

'The same ignorance makes me so bold as to absolutely deny the truth of the various ghost stories', this is Kant speaking, in his small book on the visionary mystic Emanuel Swedenborg, 'and yet with the common, although queer, reservation that while I deny any one of them, still I have a certain faith in the whole of them taken together'.²¹ I've started taking pictures of the little signs I see up at coffee shops, movie theaters, grocery stores and other spots that do a lot of business in cash, announcing that they no longer accept hundred, and in some cases fifty, dollar bills. These often hang in the foreground of the signs behind the register that itemize the traits identifying counterfeits and giving hotline numbers. It is easy for us to distrust any particular note while

20. Daniel Lord Smail, Mary C. Stiner, and Timothy Earle, 'Goods', *Deep History: The Architecture of Past and Present*, Oakland: University of California Press, 2012, pp. 219-240.

21. Immanuel Kant, *Dreams of Spirit-Seer by Immanuel Kant and Other Related Writings*, trans. John Manolesco, New York: Vantage Press, 1969.

still believing in 'the whole of them taken together'. The question of when that general trust begins to shift is a fascinating one – consider Wesley Weber, whose counterfeiting of the Canadian hundred-dollar note was sufficiently high volume that it made Canadian hundreds effectively unspendable in many large cities until the new issue. (In this context we can also look at Operation Bernhard, the Nazi project to counterfeit Bank of England notes to finance espionage and imports, and to drop in huge volumes from the air over the U.K. to crash the economy through inflation and insecurity in the currency.) There are larger reasons for the trust in currency generally, from the participation in imagined communities to the simple fact of 'passing current' – consensus understanding within a community that something accepted for payment here can be redeemed there – but part of it is technological: the technology of trust as embedded in currency itself.

A moneyer with Suns of Liberty Mint in the United States described perhaps the simplest form of this experience of trust to me: 'Silver is silver, and the weight is the weight.'²² He captures a whole world – one lost to most of us now – of monetary experience built around the intimate empiricism of metal: biting into a coin, weighing it in a scale or the palm of a hand, striking it to hear the chime. Far more elaborate versions of this process are still performed at events like the Trial of the Pyx at the Royal Mint (or, to be more precise, at Goldsmith's Hall in London), where a gathering of experts assay the coin issued by the Mint as they have for several centuries. However, even for non-experts, metallic currency contains mechanisms making it possible to do the work of evaluation – like 'milling' or 'reeding', the fine, narrow-set hatching on the edges of coins. This makes it easy to spot, or to feel with a fingertip, if a coin has been 'clipped', part of its precious metal content shaved away with a sharp knife so the coin can be spent for face value while the clipper can keep a bit of the bullion value.

Paper money takes these challenges much further: we recognize real notes by feel, by reactions under ultraviolet light or to a special pen (which doesn't actually identify valid bills, but rather reacts to the properties of toner used in color copiers and printers), by optical tricks (ink that modulates green-black in color when turned) and holograms, by size, by texture (whether the delicate, slubby feel of intaglio printing on cotton, or the crisp, glossy quality of plasticine notes), by special fibers like security threads and watermarks. Even so, counterfeit notes are surprisingly easy to pass. The canonical reference for prop money produced for film, television, and theater captures the problem.²³ The bills have to look good on camera – stuffed in a briefcase, flashed by a villain, and so on – but they are rarely in close-up, so the production facilities that produce them have found many ways to make it clear that these are not real notes. They will have fake political figures, gibberish text, misspelled words, even warnings like 'For Motion Picture Use Only' (albeit in the appropriate typeface and color for the bill, to keep it from being noticeable to an audience). Even so, prop notes have been spent. 'If it's green and says 20 on it,' said a Secret Service agent policing prop money production, 'somebody will take it.'²⁴

22. Personal communication with author.

23. Fred Reed, *Show Me the Money!: The Standard Catalog of Motion Picture, Television, Stage and Advertising Prop Money*, Jefferson, NC: McFarland, 2005.

24. Richard Fausset and Andrew Blankstein, 'Films' Fake Cash Can't Look Too Real', *Los Angeles Times*, 6 June 2001.

The problem of electronic digitization and duplication means that currency also now exists not simply as notes with particular characteristics, but as a set of international agreements embedded in software and firmware on color photocopiers, printers, and graphics editing systems like Photoshop. The EURion Constellation is a pattern of dots whose arrangement triggers currency recognition systems built into copiers, which will then be unable to reproduce the item.²⁵ (If you are holding the Mexican 20 peso note, it's the small yellow circles in the band by Benito Juárez's head; on the 10 euro note they're in the visual echoes of the arch; the American \$ 20 dollar hides them in small yellow '20's.) This is a fairly obvious ploy, and the properties that make a banknote distinguishable so Photoshop will not allow it to be scanned and manipulated are still being researched.²⁶ To manage the problem of counterfeiting even physical currency must function digitally, within a political framework of agreements and common standards, to keep its object-ness from falling into question.

Of course, on the flip-side of the question of confidence and trust is that of the behavior of the *legitimate* producers of money. Will they print too much? Will they print too little? As the cultural historian Bernd Widdig has identified, one of the crucial symbols of the experience of Weimar hyperinflation was the sheer volume of paper money: the walls lined with stacks of bound bundles of notes being tallied by clerks, the devalued notes being sold by weight for fuel.²⁷ The crisis of legitimacy – of confidence in the issue of new money – was expressed in the properties of the notes themselves. Their ink was sometimes still wet when they were rushed out to banks and businesses, a physical index of the scramble to stay ahead of the inflationary spiral; extra zeroes were stamped onto notes; under the worst conditions, some were only printed on one side. The weight, the mass of money was a direct concrete expression of how valueless it was: one would no more gather it than you would armfuls of wet, decaying leaves in the fall. Hyperinflation, underinflation, black markets in currency – Venezuela, Poland, Argentina, Brazil, Taiwan trust and confidence is a problem for the individual notes themselves (is this one good?) and for all of them generally (will it stay stable?), spurred by the illegitimate producers, selling bricks of bills for pennies on the dollar to professionals in the business of laundering them through casinos, restaurants, laundromats and retail, and by the legitimate producers who may cause the value to climb too high or fall too fast and low.

Silver is silver; notes are notes. On what other basis could trust in money rest?

The Trust Bulb

'I'm done with Bitcoin', writes the anonymous contributor. 'It was easy money, but it wasn't worth the (literal) heat'.²⁸ This was posted in the summer of 2011, when Bitcoin mining was still a somewhat easy-money proposition. He or she spins a tale

25. Javier Nieves, Igor Ruiz-Agundez, and Pablo G. Bringas, 'Recognizing Banknote Patterns for Protecting Economic Transactions', *2010 Workshops on Database and Expert Systems Applications*, 2010.

26. Steven J. Murdoch, 'Software Detection of Currency', <http://www.cl.cam.ac.uk/~sjm217/projects/currency/>.

27. Bernd Widdig, *Culture and Inflation in Weimar Germany*, Oakland: University of California Press, 2001.

28. [Dubz mining], 'had 4 machines', 4chan.org, 2011-07-01 06:08.

of woe. They were running the mining machinery in their bedroom: four boxes of ‘overclocked 5850s,’ meaning graphics cards with chips optimized to execute certain classes of operations, whose performance had been pushed beyond the preset limit by adjusting the clock speed, the rate at which it performs those operations. They were using these chips to produce solutions to the challenges posed by the Bitcoin system by generating hashes of transaction data that meet the escalating difficulty set by the algorithm. Hashes are a very well established product in computer science, a way of producing data of fixed length from data of arbitrary length. And, like the P versus NP problems mentioned above, hashing problems (appropriately configured) can take time to solve but are very quick to verify when you want check if you’ve got a correct solution.

The Bitcoin system, from the original paper circulated by the pseudonymous ‘Satoshi Nakamoto’ up to the present state of refinement and implementation, takes advantage of this property in quite a brilliant way. Or, rather, it adopts a version of hashing from prior systems like Adam Back’s Hashcash proposal, which are in some ways more conceptually straightforward and easier to understand, so we’ll start there.²⁹ Hashcash was an idea for stopping the problem of spam email (among other uses). If it takes a little time to generate a unique hash of a message’s content, its recipient, and the time-stamp of its sending, but almost no time to verify that the hash attached to an email is correct, then you can effectively ‘rate-limit’ the amount of email someone can send. When you send me a message, I won’t even notice that my email client has checked to confirm that the message you sent includes an accurate, unique hash particular to this message; nor will you notice that your machine has produced one – it only becomes an issue if you are sending, say, hundreds of thousands or millions of messages at once (as spammers must, to cast the net wide enough for a cost-effective catch of suckers and naïfs), in which case all those little hashes add up and render sending mass quantities of messages onerous. Your computers slow way down, the fans kick on, the heat billows from the vents.

Now imagine you have a network for transacting money that relies on all the nodes – everybody participating in the network – to verify that all the transactions taking place are accurate and above-board. To sustain confidence, you need to confirm that nobody’s making fake money and nobody’s spending the same money multiple times. Perhaps you can have all the nodes cast votes that each transaction accurately matches their record of what should be happening. What’s to stop many nodes under the control of one malevolent actor from casting masses of fake votes, and validating bad transactions? You rate-limit the process of validation. When participants in the Bitcoin system, or rather their machines, receive the updated ledger of transactions, they begin generating enormous numbers of hashes of the data, looking for one that meets a steadily escalating criterion of difficulty. Once it is found, they push their ‘answer’ out to the network, where it is swiftly confirmed by others; that block of transactions added to the blockchain, the master ledger, and they receive a batch of newly-minted bitcoins and all the transaction fees connected with that round of exchanges. To confirm a block of transactions yourself, fooling everyone else into

29. Adam Back, ‘Hashcash – A Denial of Service Counter-Measure’, 2002, <http://www.hashcash.org/papers/hashcash.pdf>.

agreeing with you, it's therefore not just enough to have a bunch of fake voters under your control – you must be able to do more computational work than 51 percent of everyone else on the network, so you can consistently outguess them when it comes to generating hashes of the data.³⁰ There are other classes of attack on this system as well, most notably the 'selfish mining' protocol which uses a decision process in the ledger to manipulate what is taken as the definitive blockchain.³¹ While these dangers are quite real, they don't undercut the interest of the idea: using limits within mathematics, computationally expressed, to establish a rigorous form of *timing* and build trust on that basis.

The bitcoins generated by 'mining' – that transaction validation process – are the only source of new bitcoins, meaning the ratcheting of difficulty is a throttle on the issue of new currency (making Bitcoin as a whole effectively deflationary, in ways that speak the cultic language of the Austrian school of economics). As users join the new network in the early days, adopters are rewarded by comparatively easy pay-outs from the system; as more sophisticated hardware and the associated powerful mining rigs and cartels hop on the bandwagon, the work entailed by mining goes up accordingly. It's very straightforward in practice: periodically, as the difficulty escalates, the system demands the hash of the data include an additional zero. This makes finding the correct hash proportionally more improbable – now it's not enough to find a hash valid for the data, but a valid hash like:

'000000000000000002b2d53213b1c58a82f728e2c80583f769436d6a2177c48d82'

which includes a whopping sixteen zeroes, all together, at the beginning. Stumbling across a number like this by guesswork is like hoping that a bunch of chimpanzees living in the jungle canopy will fix a crashed helicopter. To get these characters before others beat you to it on the network, and thereby get the new bitcoins and the fees, you need machines rated in terms of gigahashes per second – numbers of billions of possible hashes, produced every second. Which brings us back to the anonymous Bitcoin miner, in search of easy money, in their bedroom.

All that computational work doesn't come free, or even cheap. In the early days, it was possible to mine Bitcoin using your computer's CPU. Meeting the demands of the system soon escalated to GPUs – graphics cards, that is, better-engineered for cranking out hashes – and then, in short order, to ASICs. These Application Specific Integrated Circuits could be made to order for exactly one kind of work: not only to churn out hashes, but to meet Bitcoin's precise constraints. All this takes electricity, and all that electricity and consequent Joule heating means a new and awful world of dissipation to manage. The unfortunate miner with four mining rigs of 5850 Radeon graphics cards had been blessed with pretty good weather, so the room was 'warm, but tolerable' – but the fans on the enclosures were going at 100 percent already. The weather got hotter one day, and by the time he or she (luckily) woke up, they'd already

30. Joshua A. Kroll, Ian C. Davey, and Edward W. Felten, 'The Economics of Bitcoin Mining, or Bitcoin in the Presence of Adversaries', *The Twelfth Workshop on the Economics of Information Security* (WEIS 2013), June 2013.

31. Ittay Eyal and Emin Gün Sirer, 'Majority is not Enough: Bitcoin Mining is Vulnerable', arXiv:1311.0243v5 [cs.CR], November 2013.

developed heatstroke. Rushed to the ER, iced and hydrated, their story ended with permanent minor brain damage resulting from their brain swelling inside their skull, as though they'd barely survived a brutal malarial fever.

The photographs from the first round of Bitcoin's popularity, the images of people's awesomely eccentric home-built mining rigs, were pictures of improvised heat management. Box fans, big stretches of the corrugated tubing normally used to channel the waste heat from clothes driers, precariously poised air conditioners, and USB-powered fans resting directly on the finned heat sinks of boards were the rule. Stories abounded of early Bitcoin devotees rerouting their home flues to keep the warm, hash-generating air circulating through their houses in winter. The serious mining projects now, like Cloud Hashing in Reykjanesbaer, Iceland, and MegaBigPower in Washington (the state with the cheapest electrical rates in the U.S. due to an abundance of hydro-electric dams), are built on similar lines to the server farms described before: structured around efficient heat transfer through hot and cold corridors, with machinery neatly labeled in locked cages of perforated sheet metal, alight with flickering LEDs, and rows of Ethernet jacks.³²

Iceland, Finland, Sweden, the Pacific Northwest: one detail has been left out of this overview of cryptocurrencies and heat, a detail easy enough to miss because it's too big to see. Every cooling system is really just a heat redistribution system, exporting heat from here (the apartment, the refrigerated truck cab or train car, the interior of the computer's chassis) to there. And 'there' is always ultimately the same there. The Earth's thermal system – atmosphere, hydrosphere, cryosphere, lithosphere, biosphere – is the terminal heat sink, taking both the dissipative heat, and the exhaust of whatever moves it from here to there. This is often carbon, the incineration of coal or gasoline for the power that keeps the fans on and the refrigerant pumping through the coils, and the electricity pushing through the chips generating all those gigahashes-per-second. The irony of this situation has escaped no one: a 'virtual' currency (requiring no bulldozer-dug bank vaults, idling armored cars, or 70-ton offset presses) which consumes a lot of electrical power in the form of cooling and computational work. 'Work', furthermore, that serves no purpose beyond limiting the issue of new coins and maintaining the trustworthiness of the blockchain – a system that is, as one says of an irksome person, difficult for the sake of being difficult. The ASIC machines custom-built for this purpose can't be used for anything else; if Bitcoin should wipe out as a currency they couldn't be retooled to simulate protein folding or composite special effects. There are entire Bitcoin spinoffs, altcoins, devoted to resolving precisely this sense of inutility, like Primecoin, which uses the proof-of-work process to find prime number chains of mathematical interest.³³

'A lot': how much electricity does the whole Bitcoin system in fact consume? This keenly debated topic is full of untrustworthy, back-of-the-envelope estimates and calculations. The hyperbolic upper-bound estimates for Bitcoin's power consumption and carbon footprint (the whole nation of Cyprus! 0.03 percent of the world's total carbon

32. Cloudhashing, <https://cloudhashing.com/>; MegaBigPower, <https://megabigpower.com/>.

33. 'Sunny King' (pseudonym), 'Primecoin: Cryptocurrency with Prime Number Proof-of-Work', 7 July 2013, <http://primecoin.io/bin/primecoin-paper.pdf>.

output!))³⁴ are based on wildly varying numbers for the electricity demands made by different forms of mining equipment. Commentators look at the current gigahash rate, roughly average out the watts-per-gigahash demands of the mining equipment presumed to be most popular, squint, and end up with colossal numbers which can then be interpreted in terms of the megawatt hours in carbon according to some guesswork about countries in which mining takes place.³⁵ The lower-bound estimates, by contrast, tend to glide over the questions of infrastructure external to the work of pushing electrons around on ASIC boards – all that air conditioning. Many of the biggest mining operations enjoy significant economies of scale and make reference to various efficient load-balancing and energy management systems, all of which are of course proprietary. Hard numbers are hard come by.

Those we have, furthermore, are often framed by implicit moral arrangements in which Bitcoin work is ‘waste’, as opposed to really *useful* forms of computational work like running multiplayer online video games, streaming *Snow Dogs 2* and the abyssal ocean of pornography, and brokering and serving ads – to say nothing of energy costs for TVs and lights on in vacant rooms, half-empty refrigerators, inefficient homes, and the marquees in Times Square. In conversation with cryptocurrency advocates the question of the energy budget of conventional currency often comes up. Consider, they say, all those ATMs, guards with handguns, shipments from various mints and reserve banks, and the armored trucks loaded with hundreds of 500-dollar boxes of U.S. quarters, each weighing a bit more than 11 kilograms. To which we could add the ruined, alien-planet landscapes produced by the extraction of precious metals, the mountains of tailings and sumps of cyanide and mercury and other heavy metals. The gigahashes wasted in search of block authentication can look pretty lightweight compared to the deca-tons of waste ore produced and dumped to generate an ounce of gold.

Zoomed out to this scale – where we’re weighing Bitcoin mining against the total cost of the circulation of currency, and following the transit of heat from the interior of the chip to the edge of the tropopause – we can see a useful similarity. ‘Computational friction’, writes Paul Edwards, ‘expresses the resistance that must always be overcome, the sociotechnical struggle with numbers that always precedes reward.’³⁶ This strikingly apposite sentence is taken a little out of context, but fruitfully so. Edwards is writing, in *A Vast Machine*, about a different kind of heat management: the labor of recording, modeling, and understanding the global climate, and particularly the question of temperature, as the planetary heat sink’s properties are changed by all the carbon (and methane, and various hydrofluorocarbons) added in. To understand this project as Edwards describes it we need to understand how hard it is to do things with data. Getting it into a useful format (a format that is itself a moving target as systems and platforms upgrade), checking and storing it, moving it to where it needs to be, employing it in operations, maintaining contextual knowledge about it: data friction, metadata friction, computational friction – think debugging, repairing, doing feature extraction, struggling at the Heisenbergian limits of modeling where complexity trades off against resolution.

34. Guy Lane, ‘Bitcoin’s Carbon Footprint is out of Control’, 19 December 2013, *bitcarbon*, <http://www.bitcarbon.org/bitcarbon/>.

35. Michael Carney, ‘Bitcoin Has a Dark Side: Its Carbon Footprint’, *PandoDaily*, 16 December 2013.

36. Paul Edwards, *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming*, Cambridge, MA: MIT Press, 2010.

'It's not a bug, it's an undocumented feature!' It's an old programmer's joke: this weird unforeseen issue is actually (seen in the right light) functionality – the machine crashing whenever you try to edit $n+1$ documents at once is a helpful feature reminding you to go for a walk outside. This essay is about two big bugs, which cryptocurrency platforms refashion into complementary features. Computational friction, taking the most literal facet of Edwards' idea, turns the frustrating ceiling on computational work into a floor, a foundation, on which an institution (of sorts) can be built. The frustrating unreality of money, of the realness of any given note and trust in overall issue, is made explicit and featureful, with flawed open source code turning trust in all transactions that constitute the blockchain ledger into the basis of the trust in new money. (What makes the money money? The heat. What makes the heat valuable? That it's treated as the basis of the money.)

This is a system, in other words, in which the grain of the universe – the movement of particles, the collisions of electrons and ions – becomes a kind of friction brake on the operation of a social mechanism. Joule heating has been used as a source of visible light, and now it's been repurposed as a source of trust, a trust bulb. Like an incandescent bulb, it mostly produces heat, but it has trust as a side effect. Bitcoin's political baggage now runs the spectrum from those who'd like it 'boring', a regulated, taxed payment rail, to those who work to make it a source of great, fruitful chaos in the world, the infrastructure of an agorist society bringing down statist institutions. If we temporarily jettison that complex political cargo, it is revealed as an elegant, almost metaphysical parallel construction uniting computing and money.³⁷ Both are utterly quotidian matters that become mystical with a few pointed questions. What is it that gives money its value, built on nothing yet real enough to shape or deform the course of a life or a society? When does a physical system compute? Just about anything can be 'money' and move the agreements that constitute debt and credit. Given time, we can do the work of computing using pebbles in matchboxes, or water in ductwork, sticks and strings, cellular automata following rules.³⁸ The oblique ingenuity of cryptocurrency development was the realization that the awkward place where computing scrapes, friction-hot, against its physical substrate was precisely the place where a new kind of money could be built as an awkward fit between idea, confidence, trust, and material foundation. In their failure to be the perfect abstract models we understand them to be, lies the basis for a new, promising form where they meet in their deficiency. Made of nothing but hot air, technical ingenuity, and social fascination, the balloon takes off into the open sky.

37. Tom Simonite, 'The Man Who Really Built Bitcoin', *MIT Technology Review*, 15 August 2014; Anti-statist: Oleg Andreev, 'Crypto-anarchy does not require anonymity', <http://blog.oleganza.com/post/71410377996/crypto-anarchy-does-not-require-anonymity>.

38. See, for instance, the wonderful paper: Clare Horsman et al., 'When Does a Physical System Compute?', arXiv:1309.7979v2, 7 March 2014.

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**MONEY AS A
MEDIUM OF THE
IMAGINATION:
ART AND THE
CURRENCIES OF
COOPERATION**

MAX HAIVEN

MONEY AS A MEDIUM OF THE IMAGINATION: ART AND THE CURRENCIES OF COOPERATION

MAX HAIVEN

Economic philosophers and historians generally agree that there are three (sometimes four) main qualities of modern money, qualities that we usually take for granted.¹ First, for an object to serve as money, it must be universally and consistently accepted in a given geographic or economic area, like a nation. It wouldn't do much good if the money one received from one's employer was only accepted in some stores, or if it had wildly different values in different sorts of establishments. Second, such an object must serve as a unit of account; that is, it has to be something that can be stored, in the abstract, in bank accounts or be listed and manipulated in purely numerical terms. It seems obvious, but for this to work, money needs to be a unique, uniform, and multipliable thing, something whose value is measured in quantity rather than quality. So in prisons, cigarettes are often used as currencies because they're fairly identical, and you can owe your cellmate a certain hypothetical number of them in the future. Finally, money needs to work as a store of value, to (by and large) hold its worth over time. So cheesecakes, while delicious, wouldn't work as currencies (even if everyone were to accept them) because they lose their value relatively quickly as they age.

Fair and good. But it is important to consider another quality of money that often goes unremarked. Money is also a *medium of the imagination*. After all, for more than a century the currencies we use everyday have really been little more than eternally postponed promissory notes issued by government fiat, 'worthless' tokens meant to signify fragments of real social wealth. Today, money is even more abstract: in most of our everyday lives, cash gives way to credit and electronic monetary transactions. And, as we are quickly discovering, most of the world's monetary wealth exists purely in the conjectural abyss of the hyper-inflated global financial markets, populated by fantastical creatures like derivative contracts, swap options, and collateralized debt obligations.

Most schoolchildren at some point come to the paradoxical realization that our precious money-objects are, in fact, worthless. But even in the supposed 'good old days' before money became dematerialized and digitized, gold, silver, and other precious

1. See Bruce G. Carruthers and Laura Ariovič, *Money and Credit: A Sociological Approach*, Cambridge and Malden, MA: Polity, 2010.

metals were, in reality little more than trinkets (as Shakespeare, Voltaire, and innumerable other writers remind us). Yet the power they wield over our lives is more terrifying and more intimate than that of the most ambitious dictator.

I will argue that today a great volume of contemporary artistic production addresses precisely these contradictions and political-economic riddles by mobilizing money (bills, coins, credit cards, etc.) as a medium of creative expression, often in profound and potentially transformative ways. For instance, J.S.G. Boggs, perhaps the best known 'money artist', has sustained a three-decades long practice focused on drafting painstakingly precise, one of a kind pen and ink 'copies' of actual banknotes.² Working largely outside the contemporary gallery system, Boggs attempts to enter these artistic artifacts into circulation, seeking to 'spend' them at stores, restaurants and other commercial establishments at 'face value', candidly explaining to clerks and storekeepers that what he is offering is art, not money. Even so, Boggs' work, in its fundamentally public and relational character, attempts to draw our attention to not only the sorts of social rituals by which we determine art's value, but the sorts of unspoken everyday cultural practices that give money its value too. Boggs' work reveals that money's meaning is fundamentally suspended between the two dimensions of the term 'legal tender': it is both deeply alienating and profoundly intimate.

This is what distinguishes Boggs' work from the all-too-easy cliché of pointing out that money is, in the pungent words of the American satire magazine *The Onion*, only a 'symbolic, mutually shared illusion'.³ Everyone knows this, yet this realization has had no real impact on money's power over our lives, which grows year upon year. And we need to be careful: fairly everyone (with a very few exceptions), including right-wing nationalists, religious fundamentalists, and other ugly characters, would agree money has too much power over our imaginations and our values and would suggest a variety of horrific remedies. It's important to understand money's power over the imagination both historically and structurally to avoid these pitfalls.

Historically speaking, money's power over our lives and relationships has grown tremendously over the past forty years since the dawn of the global neoliberal revolution.⁴ As corporate and financial power has grown, it has demanded that governments adopt an ideological paradigm that encourages tax cuts (especially for corporations and the wealthy), the deregulation of industry (including finance and banking) and the privatization of social programs. Many aspects of our lives that we used to hold in common (elder care, child care, entertainment, companionship), or that used to be provided by the state (healthcare, pensions, education), are now turned into private commodities to be bought and sold.⁵ Transportation, education, healthcare and utilities (water, electricity) have all been increasingly opened up to market competition. Meanwhile, as industry has globalized (thanks to encouragement by neoliberal gov-

2. Lawrence Weschler, *Boggs: A Comedy of Values*. Chicago: University of Chicago Press, 1999.

3. *The Onion*, 'U.S. Economy Grinds To Halt As Nation Realizes Money Just A Symbolic, Mutually Shared Illusion', 16 February 2010, <http://www.theonion.com/articles/us-economy-grinds-to-halt-as-nation-realizes-money,2912/>.

4. David Harvey, *A Brief History of Neoliberalism*, Oxford: Oxford University Press, 2005.

5. Massimo De Angelis, *The Beginning of History: Value Struggles and Global Capitalism*, London and Ann Arbor, MI: Pluto, 2007.

ernments), there is increased competition for jobs, driving down wages.⁶ At the same time, there has been a massive explosion of personal debt as people try and cover the shortfall between stagnant or declining wages and the rising costs of living in a privatized world.⁷ The end result is that, today, the vast majority of us are more at the mercy of money than ever before, a fact compounded by studies that indicate that the gap between the rich and the poor is widening nearly everywhere.⁸

This is, indeed, a dire state of affairs, and one with very grim consequences. It is well within our power, for instance, to address the serious global threat posed by carbon emissions, yet we have seen the abject failure of the world's alleged leaders to address this calamity because of the power of money: no leader wishes to jeopardize the economic 'competitiveness' of their nation to help save the planet from frying. In my home country of Canada, we are seeing the despicable expansion of the Alberta Tar Sands, the largest and most carbon-intensive extractive project in human history, in the name of the holy commandment of 'economic growth'. Meanwhile, we know that, for want of money which exists abundantly elsewhere in the economy (in, say, the Swiss bank accounts or offshore tax havens of the world's richest people and corporations), millions of children suffer malnutrition, lack access to clean drinking water or die of preventable diseases.

As such, it's little surprise that we find the writing of this crisis on the proverbial and literal walls of our financialized society. World-renowned street artists like Blu and Es-cif, for example, often integrate representations of coins and bills into their murals to dramatize the growing and deepening inequalities germane to our moment of austerity, and to highlight the ever-growing power of money over society, art, creativity, and moral life. Blu, for instance, has a well-known mural in Barcelona depicting a large, predatory shark that, upon closer inspection, is composed entirely of dollar bills. A mural of his commissioned by the Los Angeles Museum of Contemporary Art in 2010, which depicted rows of wooden coffins draped in dollar bills in a fashion reminiscent of the practice of covering military coffins with American flags, was, within 24 hours, ordered whitewashed by museum management for fear of offending military enthusiasts and veterans.

But it is all too easy here to throw up our hands and succumb to comfortable platitudes: 'money is the root of all evil', it has been around for millennia, and nothing can be done about it. It is equally tempting to rise to money's defense and insist it is an innocent and neutral tool, which simply does the bidding of its fallible human masters. Neither position actually gets us any further ahead in terms of addressing and confronting money's power.

Marx on Money and the Material Imagination

In order to see beyond these false alternatives, and to better understand how and why money is a medium of the imagination, we should look to the work of Karl Marx to see the capitalist economic order as it truly is: a crisis-ridden system of exploitation

6. Walden Bello, *Capitalism's Last Stand?: Deglobalization in the Age of Austerity*, London: Zed, 2013.

7. Andrew Ross, *Creditocracy*, New York: OR Books, 2014.

8. Göran Therborn, *The Killing Fields of Inequality*, London: Polity, 2013.

that will gladly sacrifice whole populations in the name of private accumulation.⁹ While Marx's thorny writings about the method for overcoming capitalism, and about what was to replace it, have led to a great deal of tragedy, his analysis of capitalism and money is invaluable.¹⁰

In a nutshell, Marx, like many economists of his day, was interested in money as chief among many commodities. Commodities are things bought and sold in a capitalist economy, from a banana to an iPod, to an hour of a massage therapist's labor, to a piece of art. Importantly, all these commodities are, in reality, the solidifications of workers' labor. The value of any commodity ultimately boils down to how much human time and energy was invested in creating it and bringing it to market. The exchange of commodities takes place through one super-commodity (money) which fulfills the three 'qualities' listed above: widespread acceptability and convenience, uniformity for abstract mathematical manipulation, and durability of value.

For Marx's more conservative predecessors, who were seeking to praise capitalism, money was a fairly neat and tidy affair. Say I labor at raising some chickens so I can bring the fruits of that labor, eggs, to market and exchange them for, say, an hour of a shoe-maker's time to fix my boots, or the fruits of an artist's time in the form of a sculpture. Money, supposedly, just makes that marketplace more liquid: rather than having to negotiate thousands of separate exchanges (and what if the shoemaker doesn't need my eggs?), we all trade our commodities for one special commodity, money, and we're all the better for it. In fact, we can save our money to spend later, or pool it with others to do something we couldn't do alone (like build a road to make getting to market easier). Money, hence, allows for a more sophisticated economy and division of human labor, which, allegedly, benefits everyone.¹¹

For most economists, this is the logical and harmonious basis of economic life.¹² But Marx was keen to show that this bucolic fantasy was far from reality; a reality in which the European economy of his day was built on the unfree labor of enslaved people, colonized populations, and indentured servants, and in which even nominally 'free' laborers were not producing for their own benefit.¹³ True: the value of commodities came from labor, but that labor was, by and large, coerced and exploited. What's more, the coercers and exploiters took the surplus they received from selling the fruits of their workers' labors and reinvested them in reproducing their own power: they bought and monopolized new productive machines; they hired guards and bribed governments; they expanded their business interests and invested in other companies, and so on.

9. See Terry Eagleton, *Why Marx Was Right*, New Haven, CT: Yale University Press, 2011.

10. See George Caffentzis, *Clipped Coins, Abused Words, and Civil Government: John Locke's Philosophy of Money*, Brooklyn NY: Autonomedia, 1989; Costas Lapavistas, *Political Economy of Money and Finance*, London and New York: Macmillan, 1999; Anitra Nelson, *Marx's Concept of Money: The God of Commodities*, London and New York: Routledge, 1999.

11. Michael Perelman, *Marx's Crisis Theory: Scarcity, Labor and Finance*, New York and London: Praeger, 1987.

12. See David Graeber, *Debt: The First 5000 Years*. New York: Melville House, 2011.

13. On the uses and abuses of this proto-capitalist fantasy-world and the rise of bourgeois political economy and capitalism, see Michael Perelman, *The Invention of Capitalism: Classical Political Economy and the Secret History of Primitive Accumulation*, Durham, NC and London: Duke University Press, 2000.

It was (and remains) a vicious cycle, where money, put to work commanding other people's time and labor, begets commodities which can be sold for profit, which begets more money, and so on, and so on.¹⁴

Importantly, for Marx this ever-accelerating cycle actually takes on a monstrous, vampiric life of its own. After all, each individual capitalist is competing with other capitalists, in addition to exploiting their laborers. The system isn't some vast conspiracy of greedy individuals (though both greed and conspiracy exist within it); it's a self-reproducing social organization built on competition, and a deeply unfair one. It exists not to sustain the lives of workers (or even, really, of capitalists who are, individually, completely replaceable); it exists to reproduce and expand itself endlessly. And it's this force of money-in-motion, writ large, that Marx identified as 'capital', and the broader system it reproduced (and which reproduced it) 'capitalism'. It intensifies locally and expands globally, conscripting and recalibrating an ever-greater proportion of human labor energy towards its relentless expansion.

This odd synthetic and superhuman quality of money, the way in which it creates a false unity or totality between disparate elements of society and coordinates human labor into incredibly sophisticated but largely decentralized formations, perhaps explains the prevalence of collage in money art. While generally speaking this technique has been marginalized in contemporary art, artists like C.K. Wilde, Chad Person, and Mark Wagner,¹⁵ among many others, have sought to use cut up fragments of bills to create new, larger pictures. Sometimes these take the form of explicit political commentary (such as Wagner's portraits of U.S. Presidents or Person's representations of fearsome mythological beasts), sometimes as ambiguous prompts for meditation (such as Wilde's rendering of famous works of Western art history, notably Goya's *Disasters of War*). Plenty of other artists have been tempted by the symbolic potential of shredded money, a material available from Federal Reserve Bank locations in the United States, the byproduct of the destruction of decommissioned bills. The appeal of money collage perhaps stems from the acceleration of money's circulation today and the terrifying alacrity and intensity with which it decomposes and recomposes the fragmented social world. In using shredded or disassembled currency to create a new, synthetic image, an artificially intelligible totality, these works, regardless of their content, hover between utopia and dystopia.

As capitalism grows and becomes more complex in an era of globalization, and as commodities become more sophisticated, the laborers lose sight of what it is they are producing and lose any relationship to one another or the end user. When it was just the hypothetical farmer with the hypothetical chickens, the hypothetical eggs and the hypothetical market, the hypothetical world of social and economic relationships was imaginable and coherent. But with something as complicated as an iPhone it's far more sublime. The kid in the Congo who digs coltan (a rare mineral needed for circuit-board manufacture) has no relationship with the kid in China who solders the phone together, who has no relationship with the kid working at Walmart who sells it to

14. On this process, see David Harvey, *The Limits to Capital*, London and New York: Verso, 2006.

15. See <http://www.artichokeyinkpress.com/>; <http://www.chadperson.com/>; <http://markwagnerinc.com/>.

American consumers, who has no relationship with the kid who buys it and uses it until it breaks (average lifespan 18-24 months), who has no relationship to the kid in the e-waste dump in Calcutta who takes it apart for scrap metals. The dominant connection between these kids is money. The only way we have to imagine our relationship to all those others in this world with whom we are made to 'cooperate' is through money. It's for this reason that Marx famously explained that we each carry around our link to the rest of our society in our pockets. Money comes to stand in for an incredibly complicated, global system of labor, to which we all contribute and on which we all depend, but over which we really have almost no individual (or collective) control.

For Marx, when we hold money, we are actually holding two almost magical things. On one side of the coin, we possess the power to command a fragment of the future labor of other workers, maybe thousands or tens of thousands of others. Consider the labor I command when I buy a cup of coffee: not only the immediate labor of the barista who serves it to me, but a sliver of the labor of the workers who built the coffee shop, of the truckers and shippers who brought the beans to it, of the middlemen who brought the beans from the mountains of Honduras or Kenya to the port, of the plantation workers who cultivated and prepared the beans, of the death-squads who murder or intimidate union activists and thus keep coffee bean costs low, of the chemical workers who manufactured the pesticides and herbicides, and all the untold and untallied others who supported and facilitated these many labors. Money allows me to command all of this, but it also enables me to *forget* all this labor. When I receive the coffee, I thank the power of money, rather than the power of all those laborers whom I ought to thank, laborers just like me.

And here is the other side of that coin: what money also prevents me from imagining is that I, too, am caught up in this system. After all, chances are that I received that coin as compensation for the commodification of my own energies, the selling of my time to someone else. Imagine, for instance, that I am buying that coffee with the wage I received as a barista, or as a builder, or as a daycare worker or a professor on whom baristas or builders rely. My money, in this sense, is a fraction of my *own* power, alienated and returned to me in a solidified form.

In money, we *misimagine* the world and ourselves. In Marcel Mauss's memorable phrase, 'society always pays itself in the counterfeit coin of its dream'.¹⁶ We misrecognize our own collective, collaborative power to create because we see it only as our individual capacity to buy. And because of this, we fail to see that, behind the physical or conceptual object of money, there is the broader force of money-in-motion, capital, which today is in near full command of all of humanity's collaborative power to create, and uses it to reproduce and expand itself without limit or rationale. Money is a medium of the imagination which actively hides its imaginary and imaginative nature in plain sight.

Hence the interest of many money artists in experimenting with inscribing onto money other ideas, other values, other ways of comprehending and imagining social relations

16. See David Graeber, *Toward An Anthropological Theory of Value: The False Coin of Our Own Dreams*, London and New York: Palgrave, 2001.

and relationality. Canadian artist Micah Lexier, for instance, has for several years been interested in creating custom-stamped coins imprinted with short messages or single letters which, taken together in multiples, reveal a disjointed or opaque but seductive narrative. Here Lexier is at once attempting to reveal the ways in which today's capitalist form of money offers us a disjunctive, confused and abstracted story about our hyper-complex world and our place in it, as well as to suggest that artists have a key role in providing alternative, perhaps better interpretive and imaginative tools. If money binds us together and affords us the ability to imagine that togetherness based on its own unapologetic and unquestionable quantitative logic and imperialist ambitions, what might emerge from coins imprinted with purely qualitative and subjective value(s)?

Life Without Money?

Marx's theory of money is much more complex and nuanced than this brief description would imply. But this partial summary does help us see that money is neither evil nor neutral, it is an elemental feature of a much broader system, and it is also a medium of the imagination. And for that reason, money isn't always purely alien and alienating. Sociologists like Viviana Zelizer, for instance, have shown how money becomes an intimate part of people's lives, a means for them to negotiate and express their authentic feelings and relationships.¹⁷ Peter North has written a fascinating book on the ways alternative currencies can become the means for expressing (non-capitalist) utopian ideas and instigating radical communities.¹⁸ Certainly money, writ large, is not purely the tool of capitalism: nation-states and other political entities use it to impose their values and sovereignty, as in Canada, where the current right-wing government has changed the images on our banknotes to reflect its ideal of a masculine, militaristic and industrial-extractive national culture.¹⁹ Money has, for centuries, been a means to (re)produce what Benedict Anderson has called 'imagined communities', a sense of national or imperial commonality among people who will never meet and who might not otherwise share many common features.²⁰ And colonialism was enabled and reinforced by the compulsory monopoly of imperial currencies, which let subjugated peoples know who was in charge and helped control their economy and society.

An interesting meditation on these politics is prompted by the work of Peter Simensky's *Neutral Capital* project, centered around a new banknote the artist created out of the collaged fragments of various 'failed' paper currencies from around the world. Recombining alike symbols from these diverse notes into new notes of various denominations under headings like 'revolution', 'E.S.P.', 'Masculine Feminine', 'Visionaries', and 'Conjurers', Simensky's work asks us to consider the deep affinities between the nation-state, fiat currencies, and symbolic power, as well as the ways in which various

17. Viviana Zelizer, *The Social Meaning of Money: Pin Money, Paychecks, Poor Relief, and Other Currencies*, Princeton, NJ and London: Princeton University Press, 1997; *The Purchase of Intimacy*, Princeton, NJ and London: Princeton University Press, 2005.

18. Peter North, *Money and Liberation: The Micropolitics of Alternative Currency Movements*, Minneapolis and London: University of Minnesota Press, 2007.

19. Dean Beeby, 'Feminist Disappears from Public History under Harper Government', *The Toronto Star*, 27 July 2014, http://www.thestar.com/news/canada/2014/07/27/feminist_disappears_from_public_history_under_harper_government.html.

20. Benedict Anderson, *Imagined Communities*, London and New York: Verso, 2006.

governments, in spite of their geographic, cultural or political differences, share a certain aesthetic imperative and dependency. Simensky uses his new 'neutral' currency as a medium in a variety of subsidiary artistic maneuvers, including 'spending' them to purchase the artworks of others to create a mobile collection as an institutional critique of the art economy at large, which is, more than ever, dominated by finance and money.²¹

The question then becomes what to do about money. As mentioned earlier, mainstream debate tends to be polarized into two equally unhelpful (and, really, mutually supportive) positions. On the one hand, money is imagined as the root of all evil, but accepted as a necessary evil.²² On the other, money is imagined as a neutral tool, corrupted and manipulated by human foibles.²³ In either case, by consecrating or desecrating money as either angelic or demonic, politics, policy, and the political imagination are constrained to developing more sophisticated and expert-driven ways of managing money. Such a political imagination is certainly not limited to the armature of Keynesian or, later, Monetarist economics, which have been ascendant since the end of the Second World War, an approach which sees the control of the supply and flow of money and, hence, economic life, as the paternal responsibility of the modern state. Throughout modern history states and empires have sought to either protect society from money, or, conversely, protect money from society. This approach is so deeply stitched in to our political imagination that the vast majority of mainstream political ideologies really boil down to how governments ought to deal with the problem of money.

For the traditional left, the redistribution of wealth has been key, implying that the government must intervene in an unequal society by raising taxes and increasing funding to shared social programs. Limits must be placed on the accumulation of money by corporations and the wealthy, and governments should not be shy about borrowing and spending to stabilize the economy in the interests of its least fortunate members. Conversely, traditionally right-wing positions advocate less government involvement in the economy but, given that the 'free market' has actually never existed (nor can it exist) without government intervention (at a minimum, the minting of common currencies), such calls for less intervention are no less interventionist than traditionally leftist approaches. This is even more the case in a period in which, thanks to the forms of xenophobic, religious, and nationalistic right-wing populism that is the byproduct of our economic crisis, governments are increasingly encouraged to intervene to declare certain areas of society off limits to money's influence, citing allegedly superior ethical, national or religious values: citizenship, for instance, or birth control.²⁴ This is not even to mention the copious and generally increasing state spending on military and security apparatuses, largely in the interests of securing the conditions of corporate and financial accumulation.

21. See Mark C. Taylor, 'Financialization of Art', *Capitalism and Society* 6.2 (2011), capitalism.columbia.edu/files/ccs/Mark%20C.%20Taylor.pdf.

22. On this perspective, see Fredric Jameson, *Representing Capital: A Reading of Volume One*, London and New York: Verso, 2011.

23. See Niall Ferguson, *The Ascent of Money: A Financial History of the World*, New York: Penguin, 2008.

24. On the struggles over what areas of life ought to be excluded from markets, see Michael J. Sandel, *What Money Can't Buy: The Moral Limits of Markets*, New York: Farrar, Straus and Giroux, 2012.

For Anitra Nelson, Frans Timmermans, and the contributors to their recent collection *Life Without Money*, and to the other proponents of the broader paradigm of 'non-market socialism', only a rejection of money as a means to organize human cooperation can allow us to break free of money's hold on the imagination.²⁵ Nelson and Timmermans argue that the failure of the Soviet Union, China and other socialist states has been their eagerness to maintain centralized control over currency, which resulted in essentially a form of state-run capitalism that maintained the exploitation of labor and, indeed, justified political repression in the name of a greater socio-economic good. Instead, Nelson turns to the pioneering experiments of intentional communities that explicitly reject any form of currency (including labor notes, time banking, local currency, and other forms of 'grassroots' money) but, rather, organize their cooperation on the basis of intentional institutions, communal norms and a great many meetings. Nelson suggests that such a model need not be limited to tiny back-to-the-land communes, but could be inspirations for larger systems of human cooperation (a city, a nation), if we had the courage and conviction to attempt it. Whatever the case, Nelson's work is an important and provocative stimulant to our political imagination, for it forces us to consider the trust we place in money, and to more deeply question the role we assign to it. Beyond the castigation of money as inherently evil, or a plea for its exploited innocence, Nelson insists, as Marx did, that we see money as a necessary and crisis-prone expression of capitalism: a system for *organizing and imagining* human cooperative energies.

And so it should come as little surprise to us that some artists see their role as explicitly creating and sustaining other modes for organizing and imagining those cooperative energies. New York-based artist Caroline Woolard,²⁶ for instance, specializes in creating circumstances and institutions to support non-monetary exchange and barter relations between people. In addition to gallery shows, installations and events that promote new forms of exchange, Woolard has been a central contributor to initiatives like OurGoods.org, a digital platform to link up barterers in New York City, and TradeSchool.coop, a free platform that allows individuals in various cities to barter for skills and knowledge. In a similar vein, in 2012, the German group geheimagentur,²⁷ inspired by the community banking initiative pioneered by the Banco Palmas of Brazil, worked with community members and activists in the bankrupt German city of Oberhausen to establish a temporary institution called Schwartzbank²⁸ in the town's center, which enabled un(der)employed community-members to be compensated in an alternative currency (the Kohle, in honour of the town's coal-mining history), which could then be exchanged for useful goods at participating local commercial establishments. In these examples, artists are inhabiting and mobilizing the destabilized field of 'art' as a platform to reimagine and rebuild social relations from the ground up, taking up money, exchange and the social relations that surround and support them as media of artistic experimentation, with both practical and utopian implications.

25. Anitra Nelson and Frans Timmerman (eds) *Life Without Money: Building Fair and Sustainable Economies*, London: Pluto, 2011.

26. See <http://carolinewoolard.com/>.

27. See <http://www.geheimagentur.net/>.

28. See <http://www.schwarzbank.org/>.

Money as Art as Money

Since 2012, I've been creating an online database of examples of artworks like these that either mobilize money directly as a medium or make it a central concern and target of artistic intervention.²⁹ Research into this database reveals that money has proven a very difficult medium (or set of media) for artists to work with for a variety of reasons. In addition to its diverse and peculiar physical properties, money is so packed with meanings and associations that many artists find it difficult to create focused work, or to avoid the temptation to do something cliché or banal. Most artists fail. Money evokes such strong and persistent resonances within audiences that, in the hands of an unskilled or lazy artist, the physical craft or conceptual economy of money-art all too often suffers. There are innumerable artists who have painted on coins or bills, who have designed their own forms of money, or who have depicted money directly in their work. Most is atrocious, but some is extremely engaging (critics like Mark Shell and Katy Siegel and Paul Mattick consider some of the best in their fine books on the topic).³⁰

Perhaps it is a reflection of the everyday ritualistic qualities of money that explains the strong tendency in money-art towards relational or participatory orientations, even before these terms came into the vogue in the art world.³¹ In 1919 Marcel Duchamp attempted to pay his dentist with an invented cheque drawn on 'The Teeth's Loan & Trust Company Consolidated of New York'. Joseph Beuys, in the 1970s and 80s, would periodically scrawl messages like 'Kunst=Kapital' on banknotes, transforming them into art as if by magic, but in so doing revealing the magic already at play that gives money its imagined value.³² The Brazilian artist Cildo Meireles, in 1970, initiated his *Insercoes em Circuitos Ideologicos* (Insertions into Ideological Circuits) series, including the stamping of subversive messages onto Brazilian banknotes to circumvent censorship and repression under the country's ruling military junta. In all three cases, and the other cases already mentioned, these acts reveal as much about money as they do about art. Both art and money are media of the imagination: they allow us to share a vision of a world larger than us yet made up by our collective labours; they are given value through a collective material imaginary and imaginative process; they transform us through our interaction with them.

If we are always in the process of collectively imagining money's value, and imagining our co-created world (in skewed ways) through money, might we be able to do so differently? I certainly hope so, for the world capital has built through money is a deeply tragic one. Here is the potential of artists who are creating alternative currencies, not in the hopes they will some day replace the fiat currencies of the world's major powers, but as attempts to remind us of the very human and intimate world of the imagination that stands behind money. Dadara's *Exchanghibition Bank* (which designs and distributes various beautiful currencies based on non-monetary values) and *Transformoney Tree* are good examples: they invite audiences to become part of a conscious alterna-

29. See moneyandart.tumblr.com.

30. Marc Shell, *Art and Money*, Chicago: University of Chicago Press, 1994; Katy Siegel and Paul Mattick, *Art Works: Money*, London: Thames and Hudson, 2004.

31. Claire Bishop, *Artificial Hells: Participatory Art and the Politics of Spectatorship*, London and New York: Verso, 2012.

32. Joseph Beuys et al. *What Is Money? A Discussion*, West Hoathly: Clairview, 2010.

tive to the reproduction of money's imaginative and imaginary power.³³ Likewise, artists like Cesare Pietroiusti,³⁴ or Cassie Thornton,³⁵ or Mel Chin³⁶ specialize in creating circumstances and situations that reveal money's reliance and influence on the way we imagine ourselves and our relationships, or that invite us to imagine ourselves and our relationships differently. They make that process visible and intentional, where it is typically hidden, automatic and unquestioned.

The importance of this sort of work is that it opens up a gap or inserts a pause in the cycles of value and imagination that reproduce our world. It encourages us to recognize that we are being conscripted by capitalism into a set of processes that are not in our interests. Money has become both the most valuable thing on the planet, and the measure through which the value of everything else, and everyone, is imagined. The forms of money-art I have noted here ask us to pause and perhaps recognize the ways we are, each of us, made to reproduce the value of capital, and the effects this has on our lives, our communities and our planet. They ask us to question why we collectively if unconsciously give value to money, to consider what it is we *actually* value, and to imagine what it might take to build a world that actually valued those things.

Yet neither capitalism nor any of the many problems it is causing in our world will simply disappear if we all cease to believe in money's imaginary power. The system is far more material, resilient and adaptable than that. Art is, I fear, no match for money. Social movements are required that are based in the militant refusal of the status quo, and that build living, breathing alternatives.³⁷ Art's place in such a transformation is a matter of debate, but it can certainly help us realize that the current system does not reflect our values, and cause us to reflect on what it might actually take to build a system that does.

More than that, though, money plays an important role in our lives in part because it helps us imagine the unimaginable: the sublime magnitude of our collective, cooperative power. As we have seen, money allows us to understand and interact with the multitude of energies of which we are a part, the magnificent creative and collaborative power of humanity, which is today largely conscripted to the reproduction of capital(ism). If, in the future, we are to forgo money, or even if we are to decide that we wish to maintain money but somehow use it to reproduce a society based on other, higher values, we need alternative tools for imagining our collective, cooperative power as a whole, and our individual places within it. This must be one of art's key missions. Perhaps it always has been.

Coda: The Vendôme Column or the Bank of France?

Yet it is all too easy here to settle for the symbolic victory over the material one. Capitalism's power is not merely cultural: it is a vast global system of exploitation with terrible material consequences, not only on the lives, bodies and souls of workers, but now on the earth itself. It is worth walking with Marx again.

33. See <http://blog.artasmoney.com/blog/>.

34. See <http://www.nonfunctionalthoughts.net/>.

35. See <http://www.cassiethornton.com/>.

36. See <http://www.melchin.org/>.

37. See Max Haiven and Alex Khasnabish, *The Radical Imagination: Social Movement Research in the Age of Austerity*, London and New York: Zed Books, 2014.

Much of what we have explored here in terms of Marx's approach comes from his 'younger' work in the late 1840s. At this time, Marx was still largely a philosopher, the author of the *Communist Manifesto*, an activist, journalist, polemicist, and exile. His concern with money was over the ways in which it enabled not only incredible industrial exploitation and colonial brutality, but also the way it alienated people from one another, and from society, as we have explored. As I have suggested here, this is a concern over the ways in which money, specifically money under capitalism, had become a medium of the imagination.

Later, Marx would follow his interest in money to the reading room of the British Museum where he immersed himself in the writing of Adam Smith, David Ricardo, John Stuart Mill, and other 19th century political economists, such that, by the publication of the first volume of *Capital* in 1867, his concern with alienation and estrangement had been subsumed into a more detailed explanation of how labor, once transformed into commodities and capital, is used to reproduce the crisis-prone capitalist system. By Volumes II and III of *Capital*, Marx had fully transitioned out of his youthful humanism and was clearly concerned with developing what he imagined to be a revolutionary 'science'.³⁸

This transition helps contextualize Marx's response to the Paris Commune of 1871, the tremendous uprising of the common people of Paris in the wake of the Napoleon III's horrifically botched war on Prussia, which ended in France's humiliating defeat and the specter of mass starvation and poverty as the victors claimed reparations.³⁹ For two months, the National Guard and the working class citizens of Paris reclaimed their city, reorganizing the government and declaring a new order of grassroots democracy and, essentially, socialism. All this happened while under attack from the French national government, which had fled to the suburb of Versailles.

Marx was, on the one hand, impressed and excited. This was the first major implementation of the forms of socialism he and others had been proposing and fighting for decades. As such, he argued that the commune's mere existence was its most important feature: it proved that, in today's parlance, 'another world was possible', that the working class could seize power, form a government, provide for their needs and essentially organize their own cooperation without the yoke of capital.⁴⁰ On the other hand, Marx was (rightly) skeptical that the Commune would survive the combined attacks of the French establishment and the Prussian army, a prediction that was horrifically fulfilled in the brutal 'Semaine Sanglante' or Week of Blood, when between 10-20 thousand communards and Parisian citizens were slaughtered in the streets, decisively ending the experiment.

More than that, though, Marx was skeptical about the success of the Commune if it did not take radical measures to completely reorganize the economy from the ground up. He praised and admired the ways in which the commune abolished the poverty-inducing policies of the old regime and the way it instituted bottom-up piecemeal policies to improve the lives of the working class and integrated them directly into

38. See Etienne Balibar, *The Philosophy of Marx*, London and New York: Verso, 2007.

39. Karl Marx and V. I. Lenin, *The Civil War in France and the Paris Commune*, New York: International, 1993.

40. See <https://www.marxists.org/archive/marx/works/1871/civil-war-france/ch05.htm>.

democratic decision-making. But he warned that, without seizing and fundamentally transforming social wealth and the means of production (the factories, the banks), and without fundamentally transforming the role of the state, capitalism would be reproduced and the Commune would not fulfill its promise. As C.L.R. James puts it, Marx 'showed that the capitalist army, the capitalist state, the capitalist bureaucracy, cannot be seized by the revolutionary proletariat and used for its own purposes. It had to be smashed completely and a new state organized, based upon the organization of the working class'.⁴¹

Such a tension crystallized in Marx's criticism of the destruction of the Vendôme Column, a spectacle of public joy allegedly proposed by the famous anarchist artist, impresario and celebrity Gustav Courbet, who was the Commune's de facto Minister of Culture, but not present at the event itself. The column, which occupied a square surrounded by fashionable elite apartments, was a massive 213 meter pillar depicting the glories of the original Napoleon's victories, surmounted by a statue of The Emperor himself, allegedly cast out of the bronze of the melted-down canons of his enemies. In 1871, it represented the loathsome pomposity, jingoism, nationalism, repression, and elitism of Napoleon III's regime; it's toppling represented the birth of a new age.

But while Marx was no doubt pleased (he loathed Napoleon III and the bourgeoisie who fawned over him), he also bemoaned the fact that, in their penchant for symbolic, celebratory gestures and spectacles, the Commune failed to seize the Bank of France. Arguably, Marx was not only frustrated that this denied the Commune the funds it desperately needed (for it was also true that the sanctity of the Bank of France was needed if the Commune was to secure loans into the future), this oversight was symptomatic of a flaw in the Commune as a whole. As Engels wrote in his preface to a new posthumous edition of Marx's writings on the Commune, twenty years later:

The hardest thing to understand is certainly the holy awe with which they remained standing respectfully outside the gates of the Bank of France. This was also a serious political mistake. The bank in the hands of the Commune – this would have been worth more than 10,000 hostages. It would have meant the pressure of the whole of the French bourgeoisie on the Versailles government in favor of peace with the Commune.⁴²

Dedicated as it was to the creativity and vitality of grassroots resistance and the populist gestures, the government of the Commune could not take the necessary steps (at least not quickly enough) to seize the city's wealth and productive capacity. Having left the capitalist infrastructure intact, the transition to a different system was undermined. It was easier for the Commune to approve the symbolic gesture of liberation and tear down the Column than it was for them to seize the Bank, and, from there, the ill begotten assets of the capitalist class more broadly.⁴³

41. C.L.R. James, 'They Showed the Way to Labor Emancipation: On Karl Marx and the 75th Anniversary of the Paris Commune' (1946), <https://www.marxists.org/archive/james-clr/works/1946/03/paris-commune.htm>.

42. See <http://www.marxists.org/archive/marx/works/1871/civil-war-france/postscript.htm>.

43. See Kristen Ross, *The Emergence of Social Space: Rimbaud and the Paris Commune*, Minneapolis: University of Minnesota Press, 1988.

Whether Marx was correct or incorrect about the short-lived but inspiring Commune, the contrast between the Vendôme Column and the Bank of France is still very much with us today in any discussion of the politics of money, imagination, art, and alternatives to capitalism. To my mind, all too often both artists and activists become captivated by the symbolic victory: a brilliant performance reveals money's imaginary or, better, imaginative quality; a new alternative currency promises to create a system of fairer, more equitable exchange. The enthusiasm for Bitcoin is a case in point: its advocates are committed to their imagining of it as a means to 'correct' capitalism's flaws, a way to circumvent and outmaneuver the oligarchy of corporations and the complicity of governments. It is this sense a symbolic blow against the old regime. Yet plans for actually making Bitcoin or other cryptocurrencies into a means to vitally and fundamentally transform the relations of production under capitalism are much more shaky. More comforting to assume that if the grammar of money itself can be changed, the whole language and imagination of society will follow. Yet in the absence of either a strong regulatory state or powerful workers' movements, there is little to prevent Bitcoin from becoming the lingua franca of a new capitalist order or corporate oligarchy.

This is a consistent problem with the way dreams of monetary transformation preoccupy and, I would say, stunt the growth of the political imagination. Such experiments, whether in the realm of alternative economies or art projects, have the potential to undermine the architecture of belief that today's hegemonic capitalist form of money both depends on and helps reproduce. But are they not, in a way, akin to the toppling of the Vendôme Column? Are we not at risk of falling into the trap Marx identified? Do we risk mistaking a symbolic act of refusal (no doubt important) for actual structural transformation? We can find new, better ways to redistribute the wealth of the world. We can design better monetary systems to manage global capitalism. And perhaps this will lead to a slightly fairer world. But if we continue to allow money to dictate how we imagine social cooperation, and if we continue to imagine alternatives in monetary forms, are we not at risk of either, on the one hand, merely reproducing a slightly less heinous version of the old regime or, on the other, setting ourselves up for the (symbolic) slaughter as the much greater, more powerful forces of empire amass today at the proverbial gates?

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REVERSAL OF FORTUNE: VISUALIZING MARKETIZED PHILANTHROPY

STEPHANIE ROTHENBERG

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The Veneer of Philanthropy

Several years back while conducting research on crowdfunding, a website called 'Kiva' came up in my search. For as little as \$25 U.S. Dollars I could empower a poor woman in Bolivia. By contributing to her microloan of \$250, I could help her purchase a cow for her farm and jump-start her life as a global entrepreneur. Curious, I clicked on her tentative but hopeful image that led me to more details. Her finely crafted but succinct profile shed just enough information about her life to pique my empathy, alongside a selection of shocking economic statistics for her country. This information was juxtaposed to a list of lenders, complete with snapshot selfies and a personal blurb as to why they donate. As I scrolled down the list, I encountered an amalgam of responses that ranged from the banal to the self-righteous to the downright erratic: I donate because giving to others in need is good; I donate because I'm a post human; I donate because it's sexy.¹

Started as a non-profit venture in 2005, Kiva is, with similar organizations such as Global Giving, part of a growing network of so-called 'alternative' charities. These philanthropic businesses leverage social media and mobile money platforms to merge business goals with social progress. The hybridization has led to a sector of the microfinance industry that utilizes crowdfunded microlending. The result is a 'marketization of philanthropy', a philanthropy for the masses, producing a new breed of loan-borrowing 'entrepreneurs' rising from the depths of the global poor.²

As the first and largest charity platform of its kind, Kiva has received much praise in business circles and the world of celebrities including Bill Clinton, Oprah Winfrey, and *The New York Times* writer Nicholas Kristof, known as the 'White Knight' for his column on human rights. All espouse the Kiva mantra that the organization is helping to alleviate global poverty and empower the global poor through microcredit. And to some extent it is. Kiva is becoming a household name, at least in the Global North, along with the concept of microcredit/microloans, due to the popularity of platforms such as Kickstarter and Indiegogo. Through Kiva's website, the organization claims to have raised over \$605,592,375 million through 1,218,000 lenders giving to 1,403,980 borrowers with a 99.97 percent repayment rate.³

1. Kiva, <http://www.kiva.org>.

2. Domen Bajde, 'Marketized Philanthropy: Kiva's Utopian Ideology of Entrepreneurial Philanthropy', *Marketing Theory*, 13.1 (March 2013): 3-18.

3. Kiva Statistics, <http://www.kiva.org/about/stats>, accessed 7 October 2014.

But a few skeptics abound such as author and financial consultant Hugh Sinclair. Sinclair's scathing articles and book *Confessions of a Microfinance Heretic* point to several of Kiva's statistical fallacies that get overlooked within its slick marketing apparatus of emotive words and images. The highlights point towards an overall inefficient and expensive process that doesn't necessarily benefit borrowers. These include questions around the mysterious 'portfolio yields' that mask high interest rates charged by Kiva's intermediary banks (averaging 33-45 percent), hidden fees accrued by Kiva, unreported borrower defaults and corrupt bank partners.⁴

Yet these problems aren't specific to Kiva, but long regarded concerns within the microfinance industry. The real issue with platforms such as Kiva that Sinclair raises is that they produce a veneer of philanthropy. Do we really care if it works as long as it satisfies our ethical desire for that 'warm glow' we get when we give to the needy?

Reversal of Fortune

Following on the heels of earlier interactive and participatory projects that visually map the social and ethical dimensions of crowdfunding on virtual economies and digital labor, I found this question quite intriguing. Aside from the aforementioned and a few other books and articles circulating academia, this area of cultural crowdfunding had not yet surfaced in recent debates. Most of the critiques have been focused on Kickstarter-style platforms emphasizing the commodification of social relations and exploit of immaterial online labor.

I was compelled to unpack the inherent contradictions within this crowdfunded philanthropy further, and as an artist, I would do so through a tactical media approach that would confront the veneer of seductive images and rhetoric with a more realistic narrative. Kiva, being the most popular platform, seemed the best place to start. In addition, Kiva had already begun soliciting fans for their creative surplus labor by making data available through an API.

I searched around and found a few rather underwhelming attempts such as 'Kiva Cloud'.⁵ As the title states, a text cloud appears on a webpage showing the most popular words trending in Kiva loans. 'Business', 'women', 'poor', and 'future' seemed to always rise to the top.

And then there was the bizarre unseemly visualization created by Kiva's own programmers titled 'Intercontinental Ballistic Microfinance'.⁶ In this four-and-a-half minute animation, Kiva shows a five year history of funding activity set to the tune of Tchaikovsky's 1812 Overture. If you don't know the history of the song, this famous war score was written to commemorate Russia's defense of its homeland from Napoleon. In the animation depicting a world map, loans coming from the Global North are represented by exploding cannon fire shot through the air with their 'target' destination being borrowers in the Global South. Somehow I don't think Kiva got the irony here.

4. Hugh Sinclair, 'The Kiva Fairytale: It's a Microlending Superstar – But Who is it Really Serving?', *Next Billion*, 10 February 2014, <http://nextbillion.net/blogpost.aspx?blogid=3726>.

5. Kiva Cloud, <http://www.frazao.org/kivacloud>.

6. Intercontinental Ballistic Microfinance, <http://vimeo.com/28413747>.

Perversely inspired by the above examples, I decided to create my own infographic interpretations of crowdfunded microfinance. Rather than using bombs I felt plants, like the delicate leaf in the Kiva logo, were more appropriate. The outcome has resulted in a series currently in development called *Reversal of Fortune*, comprised of live and digital gardens. The gardens reflect on how empathy-at-a-distance is produced while offering a counter mapping to the flows of microfinance capital that Kiva provides its audience.

Crowdsourcing the Telematic Embrace

In his 2006 Nobel Peace Prize speech, Muhammad Yunus, considered to be the godfather of modern day microfinance for founding the Grameen Bank of Bangladesh, referred to poor people as ‘bonsai trees’:

To me poor people are like bonsai trees. When you plant the best seed of the tallest tree in a flowerpot, you get a replica of the tallest tree, only inches tall. There is nothing wrong with the seed you planted, only the soil-base that is too inadequate.⁷

For Yunus and for Kiva, and now for me, the metaphor of a plant in its struggle to survive underscores the complex relationships between human life and economic growth. This concept is taken a step further in the groundbreaking project *The Telegarden* created in 1995 by artist and engineer Ken Goldberg.⁸

Using a web interface, a global community of online users could virtually care for a live garden physically located at the University of Southern California. It is one of the earliest instances of participatory online interaction and social engagement to meet a shared goal. By collectively ‘investing’ in the future of the garden combined with the ‘outsourcing’ of labor to perform tasks to maintain it, *The Telegarden* foreshadowed new models of labor, production, and dissemination that now comprise familiar modes of crowdfunding and crowdsourcing. The project eloquently expresses the interplay of economic and technological forces realized through a telematic garden.

Even more recently, NASA announced their ‘Lunar Plant Growth Habitat’ that further extrapolates on these early ideas of telematic gardening and takes crowdsourcing to the next level – the moon. In an article in *Forbes* business magazine, the NASA team who ‘has set out to “boldly grow where no man has grown before”’ explains how they will utilize crowdsourcing to recruit thousands of citizen scientists.⁹ The emphasis will be on school children to help them conduct the experiment both on earth and on the moon. The plants in both habitats will be grown in coffee-can-sized aluminum containers equipped with cameras and sensors that enable the team to receive image broadcasts and monitor the plants environment as they grow.

7. Muhammed Yunus, Nobel Lecture, Oslo, 10 December 2006, http://www.nobelprize.org/nobel_prizes/peace/laureates/2006/yunus-lecture-en.html.

8. Ken Goldberg, ‘The Telegarden’, <http://www.ieor.berkeley.edu/~goldberg/garden/Ars>.

9. Tarun Wadhwa, ‘NASA’s Next Frontier: Growing Plants on the Moon’, *Forbes*, 20 November 2013, <http://www.forbes.com/sites/tarunwadhwa/2013/11/20/nasas-next-frontier-growing-plants-on-the-moon>.

An interesting comment in the article by planetary scientist Dr. Chris McKay alludes to this shift in space program mentality towards looking more like tech startups. The author understates the actual issue of government funding dwindling and the privatization of the industry. 'Dr. McKay sees a world of possibilities emerging from this democratization [...] When your experiment costs 300 million dollars, and you do one a decade, you can't take any risks. [...] But if your experiment is a million dollars and being done by grad students, you can do crazy and brilliant things.'¹⁰

Recent Artwork: Garden of Virtual Kinship

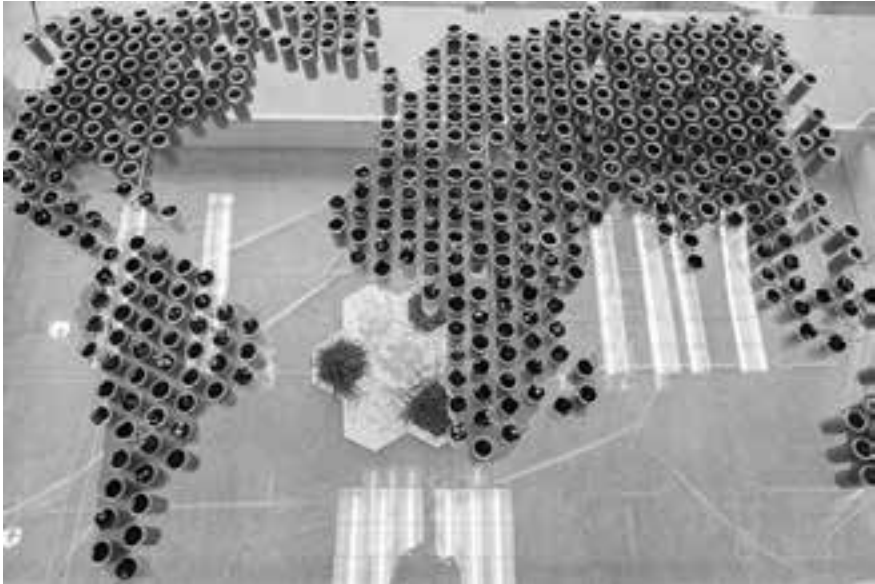


Fig. 1: Reversal of Fortune: Garden of Virtual Kinship. Photo credit: Shasti O'Leary Soudant.

With particular focus on the world of microfinance, my recent series of artworks draw upon this legacy of expressing the interplay of affect, technology, and economic forces realized through a telematic garden. The first garden in the *Reversal of Fortune* series is derived from these sources and titled *Garden of Virtual Kinship*.¹¹ Suggestive of an aquaponic system with a world map as its focal point, this garden provides a counter cartography to a real time mapping of lender donations available on Kiva's website.¹² This Kiva webpage visualization is somewhat similar in concept to the *Intercontinental Ballistic Microfinance* animation but animates the exchange of loans from lenders to borrowers on a world map in real time. Every few seconds candy colored lines jettison from one location to another in a dazzling display of humanity.

10. Wadhwa, 'NASA's Next Frontier'.

11. Stephanie Rothenberg, 'Garden of Virtual Kinship', <http://www.pan-o-matic.com/projects/reversal-of-fortune-the-garden-of-virtual-kinship>.

12. Kiva live feed, <http://www.kiva.org/live>.

In addition, a side column gives a brief description of the loan activity that links to the borrower's webpage encouraging further funding. For example: 'John made a loan, which helps Gulmira purchase additional sheep in order to develop her livestock activity.'¹³ There are also columns on what's currently trending such as borrower and lender countries and how many loans are being funded per minute. Watching the frenzy of activity is mesmerizing. It appears as if the world is being saved by your next-door neighbor.

Yet on closer inspection, it becomes apparent that some information is missing from this big picture. What about the fees from those exorbitant interest rates? Where is this money going? Who profits?

By redirecting the flow of capital symbolized as moving water, *Garden of Virtual Kinship* attempts to expose the underbelly of this conflicted system. In the garden resting at tabletop height, sits a 10 by 5 foot sheet of clear plastic. Inscribed is an image of a world map constructed from a dot matrix grid of over 500 small holes. In each hole sits a pill-sized container filled with soil and seed. These seeds represent Kiva loan borrowers who have the potential to become plants depending on the success of their loan fundraising. Overhead at 6 feet high is an automated (CNC) watering machine. Mirroring Kiva's data visualization, when a borrower receives funding, the machine moves the watering head to the correlating geographic location on the world map and the plant-borrower receives a specified amount of water.

Yet the plants only receive a portion of the water. A percentage of it based on the borrower's fees drains into a reservoir below. This pool of water continually feeds a model of the future global city flourishing with lush plants. As the water moves throughout the system scrolling LCD screens articulate these percentages and reveal the names and profits of the corporations and institutions driving the industry. Similar to an aquaponic system, the water is pumped back up to the overhead watering machine. When data comes in it triggers the machine and the cycle continues in an endless loop of both excess and scarcity.

Desiring Subjects, Desiring Plants

In her book *Poverty Capital: Microfinance and the Making of Development*, scholar Ananya Roy stresses how the alleviation of poverty has been inserted into our everyday acts of consumption, a 'politically correct' consumption.¹⁴ She refers back to Yunus' philosophical underpinnings for the Grameen Bank 'credit as a human right', and how this idea has become the cornerstone ideology for our current ethical economics.¹⁵

For Roy, microfinance is celebrated as the people's economy, democratized capital, and through social media the microcapital of the poor is converted into new financial global flows.¹⁶ Roy explains:

13. Kiva lender's page, <http://www.kiva.org/lend/778631>.

14. Ananya Roy, *Poverty Capital: Microfinance and the Making of Development*, New York: Routledge Press, 2010, p. 2.

15. Roy, *Poverty Capital*, p. 23.

16. Roy, *Poverty Capital*, p. 32.

On Kiva.org [...] users can integrate such conscientious practices with the techno-social rhythms of their daily lives. Kiva “lets you browse loans on Facebook, and show off your loans in your Facebook page.” There is Kiva for the iPhone, which “lets you get your Kiva fix from anywhere you bring your phone,” and Kiva Tweets, which “automatically posts new loans to your Twitter account daily or weekly.”¹⁷

Through Kiva and similar platforms, the ethical economy meets the reputation economy. With every ‘like’, the privileged are empowered to empower the global entrepreneur in a seamless circuit of warm and fuzzy affective production.



Fig. 2: Reversal of Fortune: Desiring Subjects, Desiring Plants.

These techno-social rhythms that Roy describes are animated in another garden in the series entitled *Desiring Subjects, Desiring Plants*.¹⁸ In this installation grow lights immerse the viewer in a garden of illuminated hanging planters constructed from clear plastic tubing. The effect is suggestive of a strange bio-laboratory setting.

Each hanging planter is equipped with its own automated watering system – an IV bag holding water along with a small LCD screen and audio speaker. When a loan from the Kiva website receives funding it activates the system. The IV bag releases a drip of wa-

17. Roy, *Poverty Capital*, p. 33.

18. Stephanie Rothenberg, 'Desiring Subjects, Desiring Plants', <http://www.pan-o-matic.com/projects/reversal-of-fortune-desiring-subjects-desiring-plants>.

ter. The screen displays text from the lender's profile page as to why they donate. The audio speaker speaks the message such as 'I donate because it's sexy'. The result is a real time cacophony of scrolling messages and synthetic voices emoting the feelings of lenders from around the world, or rather the Global North.

Feed the Children Entrepreneurs

Having grown up on American television commercials from the 80s and 90s, I can never forget the sorrowful face of actress Sally Struthers. Known for her role as Gloria on the 1970s television sitcom *All in the Family*, Struthers later became the poster lady for the Christian Children's Fund 'Feed the Children' campaign.¹⁹ The campaign set the standard for the 'charity' television commercial. Struthers in the foreground looking earnest while poor children in the background dirty and covered with flies, helpless victims of their poverty, arouse your guilt.

If we fast-forward to the present, Kiva founder Jessica Jackley is the modern day Struthers outfitted with a young, hip look and a new narrative. In her TED Talk from 2010 that received 1.1 million views and counting, the attractive, bright-eyed and spunky Jackley identifies with the burden of privilege.²⁰ Having spent time in Africa during her college years, she came to the realization that it was more effective to help the poor help themselves. We no longer need to feel guilty about our overpriced Starbucks cappuccino. Through the magic of microlending, we are empowered by empowering a poor farmer in the entrepreneurial potential of owning his own coffee bean plantation.

Microfinance is considered the new frontier in the manufacturing of development investment. It follows capitalism's circuit of primitive accumulation, constantly seeking out new terrain that will provide fertile conditions for both development and reconstruction. Roy refers to an essay written by economist and Senior UN Advisor Jeffrey Sachs, one of the key interlocutors of the UN's Millennium Development Project started in 2002 to alleviate global poverty. Written shortly after 9/11, the essay titled 'Weapons of Mass Salvation' finds Sachs making the case that 'one cannot fight a war against weapons of mass destruction through military means alone'.²¹

Over ten years later, what is the new weapon of mass salvation? Could it be philanthropic crowdfunding with its ability to leverage middle class emotions in order to mobilize new financial assets from the global poor? And what about crowdfunding's underlying mechanisms that function to aid the impoverished but also to fund a work of art?

In a culture of big data that has become increasingly over aestheticized, can questions such as these still be answered through visualization? Can the messiness and unpredictability of plants as data in the *Reversal of Fortune* artworks interrupt the streamlined algorithms? Can a different story be told through data that embodies and makes

19. Christian Children's Fund 'Feed the Children', campaign video, <https://www.youtube.com/watch?v=XsxVy7vyyk0>.

20. Jessica Jackley, 'Poverty, money –and love', TED, July 2010, http://www.ted.com/talks/jessica_jackley_poverty_money_and_love?language=en.

21. Roy, *Poverty Capital*, p. 144.

visible the complex lives that are so often overlooked when abstracted? And for David Bowie's sake, will there be plant life on Mars?

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(W)ORLD CURRENCY

PAOLO CIRIO

(W)ORLD CURRENCY

PAOLO CIRIO

(W)orld Currency is an artwork that illustrates a global currency through the creative formulation of an equation and a trading algorithm for the currency exchange market. The visionary creation of algorithmic trading combines art with the material that governs contemporary society and in doing so, it aims to introduce new art practices.

The artwork seeks to inspire social transformation through envisioning a positive and innovative economic tool. It addresses the inherent instability of various currencies, as well as the need for a new independent global reserve currency that could potentially empower and unite the world population. As a sustainable financial instrument, the World Currency Equation will act as a cushion that will protect people against the increased volatility of individual currencies due to speculative manipulations and economic swings, while preserving market access across different geo-political and social domains.

The proposed algebraic equation provides valuation and liquidity for a new currency (W) based upon the average of an index of individual currencies. The formula combines and secures dominant national currencies with new digital and local complementary currencies, preserving autonomy and diversification within universal acceptance.

The artwork is illustrated through the artistic expression of a mathematical equation and a diagram of an algorithm. These two elements indicate how the value of the currency is calculated and how its liquidity is created and maintained.

How it Works

World Currency is a global reserve currency backed by popular currencies. It's based on a value-weighted index, in which each currency in a basket influences the index in proportion to its exchange rate and spread for every combination of pairs of currencies traded. The overall average of the rate exchanges determines (W). In the system, the value of (W) is kept steady by the daily trading of each currency in the basket in an interconnected network of deposits. For every node of the network each currency is stored only for the average amount of the whole network. The gains and losses are also leveled equally in every deposit. The equal distribution of multiple reserve currencies always maintains (W) with liquidity and stable value.

The equation and the algorithm make use of Forex market conventions and can only include currencies that are tradable electronically.

The Equation

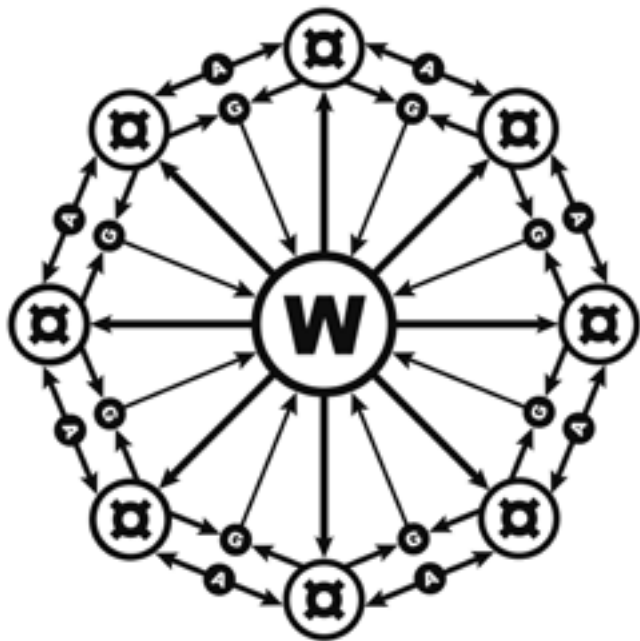
The following equation illustrates how (W) is calculated upon an aggregate of exchange rate values of a basket of leading currencies within the gains and losses that the fluc-

tuations among them generate over time. The mathematical average of the values of currencies (A) in the basket keeps the value of (W) steady. The gains compensate the losses in the total average (G).

$$W = \left\{ \frac{\bar{G} = \left[\frac{\sum_i^n \left(\frac{V^t Cx_i + V^{t-1} Cx_i}{V^t Cx_i} \right)}{n \text{ Currencies}} \right] + \bar{A}}{\bar{A} = \left[\frac{\sum_i^n \left(\frac{Cx_i}{Cx_{i+1}} + 1 \right)}{n \text{ Currencies}} \right] + 1} \right\}$$

The Algorithm

The following diagram illustrates how an algorithm can automatically aggregate (W) by wiring currencies over the multiple reserve deposits based on the recursive calculation of the (W) equation.



Glossary

W: Value of World Currency. Symbol (W).

α : Any currency symbol in the basket.

A: Average of exchange rates between each pair of currencies in the basket.

G: Average of spreads between each pair of currencies in the basket over time.

N: Number of currencies in the basket.

Cx: Current exchange rate of the currency of the index.

V: Current value of the currency of the index.

T: At past and future time period.

Credits

Images and picture courtesy by the artist Paolo Cirio

Commission

Artistic Bokeh and Quartier21, Museum Quarter, Vienna – Austria

Selected shows

London Design Festival, exhibition at Victoria and Albert Museum, 2014, London – U.K.

Synthetisch Vernünftig, exhibition at LEAP, 2014, Berlin – Germany

In Search of Symmetry, exhibition at HDLU, 2014, Zagreb, Croatia

THE FREE MONEY MOVEMENT

JIM COSTANZO

THE FREE MONEY MOVEMENT

JIM COSTANZO

The Aaron Burr Society (ABS) launched the *Free Money Movement* on Wall Street on April Fools Day 2009. ABS was inspired by the bailout of Wall Street banks after the 2008 international financial meltdown. A small group of videographers and performers joined ABS on the mall between the New York Stock Exchange and the Federal Building where George Washington was sworn in as the first president. From there the group marched a few blocks north to the Federal Reserve Bank, then to the Museum of American Finance, and returned to where we began.

The goal of the performance was to distribute 100 one dollar bills stamped with *Free Money* on one side and *Slave of Wall Street* on the other. ABS's website¹ was also stamped on the paper currency, actual Federal Reserve Notes. The goal was to raise awareness of the predatory nature of capitalism and the Wall Street agenda of deregulation, fraud, and bailouts.



Fig. 1: Stamped U.S. dollars – Federal Reserve Notes, 2009-2014.

1. See http://www.aaronbursociety.org/aaron_burr_society_home.html.

Later in the year, ABS printed *Revolutionary Script* using a letterpress to print on hemp paper. The *Script*, outlining philosophical and policy statements, intended to question and suggest alternatives to capitalist monetary control. The document was printed on both sides; the front promotes nationalizing the Federal Reserve Bank (the Fed) by eliminating private bankers who run the national bank. Other aspects included giving no-interest loans to the people instead of to Wall Street and calling for a common-wealth based on the 21st century concept of the commons.² It advocates for ‘Democracy Not Hamiltonian Plutocracy’, a reference to Alexander Hamilton, America’s first Treasury Secretary. Hamilton, founder of the First National Bank, introduced the United States to an early form of British capitalism. ABS’s namesake, Vice-President Aaron Burr, killed Hamilton in a duel, and although Burr’s political career eventually ended badly, after killing Hamilton he returned to Washington DC, and finished his term as Vice-President.



Fig. 2: Revolutionary Script.

ABS continues to distribute *Free Money* using a viral strategy that circulates stamped bills through monetary exchanges in bars and shopping in assorted venues. During Occupy Wall Street (OWS), ABS added an *OccupyWallSt.org* stamp. Thousands of dollars have been spent across the U.S. and in 2012 ABS was invited to the 7th Berlin Biennale as part of Occupy Museums and distributed stamped Euros.



Fig. 3.1: Free Money Portland, 2013.



Fig 3.2: Free Money in Humboldt County, 2013.

2. While this is an abstract concept with no set definition, most would agree that it is about establishing local autonomy and economic independence based on universal human rights. Worker, food, and farming coops, local green energy production, open source software and direct democracy are often cited as part of the commons.

In 2014 ABS added a *Common Good/Commonwealth* stamp which alternates with *Slave of Wall Street*, while the opposite side is always *Free Money*. The latest addition provides a comparison between giving money to Wall Street and the 1 percent, or using our commonwealth to invest in the common good.



Fig. 4.1: Back of *Free Money* distributed by 2012 Berlin Biennale bookstore, 2012.



Fig. 4.2: Dramatic recreation of discussion about Free Money with anonymous M15 member who lives without money, Berlin Biennale, 2012.

Though founded before the corporate sponsored Tea Party, ABS' goal was to counter long-standing conservative strategies that distort history by conflating liberty and nationalism with capitalism. From the beginning, the plan was to present an alternative American history from a radical, populist perspective, informed by Marx and emerging theories on the commons. Though ABS started as an absurdist, conceptual public art-work, it has always taken great care to be factually accurate. We have exercised poetic license with terms like *Free Money*, but the issues addressed are serious.

Genesis

Those who control the present, control the past and those
who control the past control the future.³

– George Orwell, 1984

ABS originated in the spring and summer of 2008, just before the crash of the international financial markets, but it was a sign placed in front of the New York Stock Exchange in 1992 that forms the basis of ABS's philosophy. REPOhistory's *Lower Manhattan Sign Project* included an artwork that I created titled *Advantages of an Unregulated Free Market Economy*. The text on the back of the sign read:



Fig. 5: REPOhistory 1992, photo Tom Klem.

Myth: Traders and brokers jumped from Wall Street skyscrapers after losing their fortunes in the 1929 stock market crash.

Reality: No suicides occurred in the Wall Street area immediately after the 1929 crash. Brokers and traders make a profit for each transaction regardless if the market goes up or down. Investors lost money. The real losers were workers who lost their jobs in the Depression.

Facts: In the late 19th century, the 1920s, and 1980s, conservative government policy manipulated the market economy which led to artificial economic booms that transferred the wealth of the nation to the top 1% of the population. In each era these policies caused crashes and depressions.

During the 1980s while corporations and the rich became substantially richer, the standard of living for working and middle class Americans fell.

3. George Orwell, 1984, New York: Signet Classic, 1977 (1949).

Leveraged buyouts, hostile takeovers, insider trading, junk bond scandals and Savings and Loan frauds were all aided by administrations that opposed government regulation of financial markets. Other government policies encouraged industrial deregulation, an increase in personal and national debt, high interest rates, and lower taxes for the rich and corporations.

These policies have undermined America's industrial and financial institutions. The middle and working classes will spend the 90s paying for the excesses of the 80s.

Armed with the knowledge gained from my research, the looming economic crash of 2008 was obvious. In June of that year, *Harper's Magazine* published my letter to the editor in response to an article about how environmental sustainability would be financed by the next bubble.

Toil and Trouble

"The Next Bubble" [Report, February] provides an excellent summary of business cycles and the forces that drive them, but Eric Janszen fails to make one crucial point: the economic bubbles we have experienced were not victimless crimes committed by nameless perpetrators but deliberate strategies to drive wealth to the top of the economic pyramid. In each and every case, these bubbles have been abetted by government deregulation and even fraud, and have ultimately served to widen the income gap between the rich and poor.

The real estate bubble targeted African Americans and other minorities and is an especially egregious example of this phenomenon. Alan Greenspan, who was warned about predatory lending tactics, did nothing to curb such practices even as he dropped interest rates to unprecedented lows. But Greenspan isn't alone in his culpability: at the height of the bubble, Congress passed laws on credit and bankruptcy that undermined borrowers' ability to cope with debt. A close reader of this legislation might be excused for assuming these laws were created with the intent to maximize ill effects if and when the bubble burst.

Lastly, as our economy descends into chaos, no one should forget the personal contribution of President George W. Bush to our financial disaster. Given the current state of affairs, his promise to replace traditional government welfare programs with a new social order, the "Ownership Society", has proven absurd at best, and at worst criminal.'

Harper's Magazine, June 2008

Little has changed but the names since I wrote the letter, while the neo-liberal economic programs continue. After trillions of dollars spent on bailouts, quantum easing is still giving banks \$85 billion a month, keeping the current bubble inflated. The gap in income between the 1 percent and the 99 percent is at an historic high and increases daily.

Following the letter to *Harper's Magazine*, I began performing on Wall Street. Wearing a two-sided sandwich board sign, I began panhandling. The sign, which formed the basis of ABS, proclaimed that I was trying to raise \$100,000 to attend a political fundrais-

ing event so that I could buy a politician. The ABS is called after Vice-President Aaron Burr who killed former Treasury Secretary Alexander Hamilton in a duel. Hamilton was America's first capitalist and he created the first National Bank. But I also remembered Gore Vidal's historical novel *Burr* where Burr is described as a sympathetic though complicated character, not as the villain of the early Republic. I later learned that Burr was a radical who supported the French Revolution and a more democratic government at home. For these and other reasons, Burr turned out to be a unique prism through which to reexamine American history.

*Dedicated to Exposing the Myths of Free Markets and Free Trade While
Challenging the Integrity of Wall Street and their Corporate Cronies*

Aaron Burr Society motto



Fig. 6: Aaron Burr Society card, motto printed on back.

Historically the policies of Wall Street and King George, though different, are similar in that the king used corporations like the East India Company to extract wealth from the colonies. But because of distance and length of time involved in communications, the colonies had a certain degree of autonomy. The American Colonies could issue paper currency to facilitate local trade and commerce. In 1729 Benjamin Franklin published a pamphlet about the importance of paper currency,⁴ not only for trade and commerce, but also for the workers, craftsmen, and small shop owners. Paper money, or fiat currency, was one of the reasons that the colonies were prosperous. After the French and Indian War of 1754-1763, the British government passed the Currency Act of 1764, limiting the Colonies' right to issue currency as legal tender by making that the exclusive right of the Bank of England. This, more than the Stamp Act or taxes on tea and other goods, transformed the Colonies from prosperous settlements to communities in debt and struggling to survive.

4. Benjamin Franklin, 'Enquiry into the Nature and Necessity of a Paper Currency', 1729.

After the Revolution, under the Articles of Confederation, individual states returned to issuing paper money to help farmers and workers pay their debt. At this time states were under pressure to help their citizens because financial speculation on Revolutionary War Bonds was an important reason for raising taxes. Shays' Rebellion (1786-87) was the first instance of armed rebellion based on debt.

The crisis of the 1780s was most intense in the rural and relatively newly settled areas of central and western Massachusetts. Many farmers in this area suffered from high debt as they tried to start new farms. Unlike many other state legislatures in the 1780s, the Massachusetts government didn't respond to the economic crisis by passing pro-debtor laws (like forgiving debt and printing more paper money). As a result local sheriffs seized many farms and some farmers who couldn't pay their debts were put in prison.⁵

One of the most important reasons that the Constitution replaced the Articles of Confederation was to end the pro-debtor laws passed by individual states. James Madison, the primary author of the Constitution, was often quoted saying the Constitution would insure that the 'right people' would retain power. Or as Madison wrote in *Federalist Paper #10*, 'A rage for paper money, for an abolition of debts, for the equal division of property, or for any other improper or wicked project, will be less apt to pervade the whole body of the Union'⁶ The Constitution guaranteed that *wicked projects* like economic and social justice were not to be tolerated.

Weeks before Washington took office as the first president, John Scull, the printer, editor, and publisher of the *Pittsburgh Gazette*, wrote this editorial:

The Framers of the Constitution bestowed the most watchful attention to prevent you from enjoying, under it, at any future time, an opportunity of expressing your sentiments of it by an equal representation. They provided no other mode of reformation than the inadequate and unequal one of a council of censors. Amendments to the Constitution requires a two-thirds majority.⁷

This editorial laid the foundation of the Whiskey Rebellion of 1791 that was sparked by Constitution and later fanned by Hamilton's capitalist policies.

Money is a form of social exchange. That is why we must look to the Constitution since it defines and regulates economic, social, and political exchange. The Constitution set the legal bases for the Supreme Court's *Citizens United* ruling that gave corporations the rights of citizens and a 2014 decision that Argentina must first pay hedge fund speculators before paying for education, health care, and infrastructure.⁸

5. U.S. History: Pre-Columbian to the New Millennium, '15a Shay's Rebellion', <http://www.ushistory.org/us/15a.asp>.

6. *The Federalist No. 10: The Utility of the Union as a Safeguard Against Domestic Faction and Insurrection*, Publius [James Madison], 22 November 1787, Constitution Society, <http://www.constitution.org/fed/federa10.htm>.

7. See John Scull, *Pittsburgh Gazette*, 16 May 1789.

8. Ellen Brown, 'Cry for Argentina: Fiscal Mismanagement, Odious Debt or Pillage? The Web of Debt Blog', 12 August 2014, <http://ellenbrown.com/2014/08/12/cry-for-argentina-fiscal-mismanagement-or-pillage/>.

Another example is a Detroit judge ruling that debtors who did not pay their bills have no right to water.⁹ These rulings illustrate that the Constitution values property rights over human rights. To write a Constitutional Amendment that bans corporate citizenship will not change the relationship between creditors (the minority) and debtors (the majority).

Our collective wealth, our commonwealth, is not *Free Money* but what is rightfully ours. The purpose of the *Free Money* Movement is pedagogical, designed to enlighten people. The Constitution protects the rights of creditors who break the law to entrap debtors. That is why the Declaration of Independence, though flawed, must supersede the Constitution. This collectively written manuscript calls for universal human rights beyond the boards of the original thirteen American colonies. It declares all men people are created equal and has the right to life, liberty and the pursuit of happiness. This call was taken up and modified by the French and the Haitian Revolutionaries. These Enlightened ideals are linked to The Universal Declaration of Human Rights, a declaration adopted by the United Nations General Assembly in 1948.

The Whiskey Rebellion of 1791-1794



Fig. 7: Alexander Hamilton's portrait on stamped \$10 bill.

Before Marx there was opposition to the emerging economic system that would later become known as capitalism. After the American Revolution, there were five armed rebellions against the newly formed republic. Shays' Rebellion is the best known, but the Whiskey Rebellion was the most significant. The Whiskey Rebels were centered in the Western Frontier of Pennsylvania. They rebelled against financial speculation and a two-tiered economic and tax system that privileged the wealthy and a Constitution that valued property rights over human rights; slave-holding and limited voting rights to property-owning white males being just two examples.

9. Rebecca Savastio, 'Detroit Judge Rules There Is No Basic Human Right to Water', *Guardian Liberty Voice*, 1 October 2014, <http://guardianlv.com/2014/10/detroit-judge-rules-there-is-no-basic-human-right-to-water>.



Fig. 8: The Society's distillation on Oxbow Creek up-state New York, 2010.

The primary cause of all of the rebellions was speculation on war bonds that led to high taxes, which often resulted in foreclosures. The Federal government's assumption of the individual state's debt was actually a bailout of speculators who bought war bonds for pennies on the dollar. Hamilton insisted that speculators, not the soldiers or framers who earned the bonds, would receive face value for bonds they spent pennies acquiring. This was a huge, unearned profit that set a precedent for 2008 Wall Street bailout.

Other examples of Hamilton's economic and tax system involved the tax on whiskey. Whiskey was taxed according to the volume of the still, not on the actual production. So if a small farmer had a 10-gallon still, she would pay the same taxes as a slave or factory owner. The farmers in Western Pennsylvania were limited in the amount of time dedicated to producing whiskey by the amount of other work needed to run a family farm. Slave and factory owners could run their stills seven days a week and could afford the tax that was impossible for the small farmers to pay. The secondary purpose of the tax was to stop local production and promote large manufacturers, an essential aspect of capitalism.

The Western Pennsylvanian farmers couldn't afford the cost of shipping grain east over the mountains but shipping whiskey was profitable. By using their own labor to transform grain to whiskey, farmers usurped capital's power. And whiskey was also used as a form of local currency similar to paper money.

Secretary of Treasury Hamilton's two-tiered economic policies replicated British capitalist programs imposed on the colonies. This included the establishment of the First National Bank, a precursor to the current Fed. Working in conjunction with the Constitution's Article 1 Section 10 that took away individual state's rights to create money, the National Bank controlled the monetary system just as the Bank of England before the Revolution.

After the rebels surrendered, John Skull's name was taken off the masthead of the Pittsburgh Gazette during the American Army's occupation. Months later his name returned and he wrote this editorial:

True liberty, like true religion, is known by its fruits. Liberty, the daughter of Heaven, and the best gift of God to a favored people, a generous principle, whose object is the peace and prosperity of the human race; must produce fruits worthy of the divine origin; meekness, justice and love of one another. Licentiousness, the offspring

of hell, and the scourge of an offending nation, selfish in its nature, and seeking the degradation of all but itself, bears fruits of an opposite nature; sedition, fury, hatred, malice and mischief. By its fruits judge, whether our insurrection proceeded from a spirit of liberty, or of licentiousness; whether it was the work of God or the Devil.¹⁰

Skull, like many of the founders, was a Deist so the reference to god was metaphorical. But the Devil was Hamilton and capitalism.



Fig. 9: Aaron Burr Society whiskey still at Carnegie Mellon University 2010.

Secretary of State Thomas Jefferson would resign because of Hamilton's economic policies. Later Jefferson asked former U.S. Senator Aaron Burr to be his running mate as Vice-President in the 1800 election. Burr left the Senate and returned to New York City to organize against fellow New Yorker Hamilton and the Federalists. By 1799 Burr had created the Manhattan Company to bring clean water to New York City during a yellow fever epidemic. But instead of taking profits, Burr used the surplus capital to give loans to the working classes, shop keeps and others denied credit by Hamilton's New York State banking monopoly. Burr also passed a law allowing inexpensive land coops that permitted the working classes to own property and vote.

These actions catapulted Burr to a tie with Jefferson. Jefferson immediately turned against Burr because he was a threat to Jefferson's next term. Burr was also against slavery and Jefferson wanted fellow slave-owners James Madison and James Monroe to follow him in office. Burr's radical politics had made enemies of Hamilton's bankers and Jefferson's slave-owners. Together they destroyed Burr's political career and personal reputation.

Though largely forgotten, the lessons from the Whiskey Rebellion, the Manhattan Company and the politics of land coops are important. Local communities need political power to access capital as a means of social exchange. This can empower local communities to produce their own food, energy and other daily necessities based on mutual aid and direct democracy, conditions that were common to early frontier communities and are important for contemporary communities. These types of communities can resist capitalism's demand for endless growth and the destructive extraction of resources on a finite planet. Capitalism only values profits, not people, communities

10. *Pittsburgh Gazette*, Pittsburgh, Pennsylvania, 17 December 1794.

or the environment. Capitalists are responsible to stockholders, not citizens or governments. People and the environment are liabilities or expenses that must be repressed or destroyed for profits. That is why we must move beyond capitalism to empower people and communities based on mutual aid and autonomous production.

Multiple Paths to the Commons

ABS is still active with OWS working groups Strike Debt,¹¹ Making Worlds, a Commons Collation and occasionally Occupy Museums. Strike Debt published the *Debt Resisters' Operation Manual*¹² and launched the Rolling Jubilee.¹³ The *Manual* informs debtors about their rights and forms of resistance both for individual and government debt. There is also a chapter on 'Climate Debt', the debt industrial nations owe to the developing world for creating the pollution that causes climate change. The Rolling Jubilee purchases personal debt that is in default and sold to vulture capitalists for pennies on the dollar. The vulture capitalist then try to collect the full amount of the debt by harassing the debtors, a practice that goes back to Revolutionary War bonds. Rolling Jubilee has raised over \$700,000 to purchase and abolish \$18.5 million of defaulted debt without any obligations from the liberated debtors. Though \$18.5 million of debt is a large sum, it is nothing compared to the trillions of dollars of debt owed by individuals and the state. The purpose of Strike Debt and Rolling Jubilee is to raise awareness of the predatory nature of debt and to build a debt resisters movement. Making Worlds has produced two international forums on the commons. The range of topics is broad and based on building alternative structures within capitalism that are transformative. They include land trusts; worker, energy, and food coops; creating collations that protect the environment; open source software and collective use of technology.



Fig. 10.1: Making Worlds meeting at Momena Art in Bushwick Brooklyn, part of an Occupy Museum's month long action, October 2012.

11. See <http://strikedebt.org>.

12. Strike Debt, *The Debt Resisters' Operation Manual*, Brooklyn, NY and Oakland: Common Notions/PM Press/Autonomea, 2014.

13. Rolling Jubilee, <http://rollingjubilee.org>.



Fig. 10.2: Author at Public Banking Institute Conference, 2013.

An article twice this length would be needed to describe the activities of these working groups, so I will stay focused on monetary policy. Please be aware that I do not speak for OWS or any working group. However, I have represented different working groups at public venues including Strike Debt at the 2013 Public Banking Institute conference Funding the New Economy.

OWS exposed the half public, half private nature of Zuccotti Park, which is actually the central contradiction of capitalism. Adam Smith's *The Wealth of Nations* proposed that the state should create infrastructure, promote commerce, and then allow entrepreneurs to use Free Markets and Free Trades for personal profits.

America's first Treasury Secretary, Alexander Hamilton, didn't believe in Free Markets or Free Trade.¹⁴ Hamilton bailed out speculators and placed tariffs on imported manufactured items in order to protect emerging American industries. He did use tax dollars to build infrastructure but he chose who would profit. Capitalism has never actually relied on the invisible hand of the market but is based on usurping tax dollars and exploiting government programs to build private fortunes. Neither IBM, AT&T, nor any consortium of companies, had the resources to develop the computer which was bankrolled by government contracts and research financed by taxes. Cell phone tech-

14. Susan Dunn (ed.) *Something that Will Surprise the World: the Essential Writings of the Founding Fathers*, New York: Basic Books, 2006.

nology was developed by government research grants to universities. And corporations profit from technological advances from the military and space programs. Private corporations are allowed free access to technology that is paid for by the people's commonwealth without paying fees or their fair share of taxes. Since the end of World War II, approximately half of the U.S.'s budget has been spent on the Military Industrial Complex that funnels vast sums of money to private contractors. If half of the budget is controlled by government programs are there really Free Markets? And can anyone actually argue that there is Free Trade in light of the number of declared and undeclared oil wars in the Middle East?

After WWII the U.S. assumed leadership of the 'Free World' because of its military power and the British Empire's default on its war debt. The 1944 Bretton Woods Agreement established the U.S. dollar as the reserve currency and created the International Monetary Fund (IMF) and World Bank to protect the dollar. The reserve currency requires other nations to hold a significant quantity of U.S. dollars as part of their foreign exchange reserve and that the U.S. dollar is used in international transactions.¹⁵ Money is power and the dollar works with overwhelming militarily superiority to enforce the rule of the American Empire.

At home the U.S. companies have their taxes reduced by shipping jobs overseas. The state uses tax payers' money to subsidize corporations for building shopping malls dominated by transnational corporation that are also subsidized. These corporations and monopolies couldn't survive without government support. Abroad the American Empire and its industrial allies use the IMF and the World Bank to place developing countries in debt, a tactic with a history. Haiti is still paying reparations, or debt, to France from their slave rebellion in 1791.¹⁶ This type of odious debt is the legacy of colonialism, imperialism, and current neo-liberal policies. This is different but parallel to the odious debt imposed on the citizens of the industrial world from the 2008 international financial meltdown that resulted in tens of trillions of dollars in bailouts paid for by taxes on working people and cuts to social programs. Odious debt¹⁷, also known as illegitimate debt, is an international law theory that holds that national debt, sustained by a regime for purposes that do not serve the best interests of the nation, should not be enforceable.

In 2012 between \$20 and \$30 trillion went to offshore accounts that paid no taxes and did not create jobs.¹⁸ In addition the stock markets and corporate profits are at record highs while governments demand austerity. 'Large-scale tax evasion skews key economic statistics, it hampers officials' ability to manage the economy or make

15. The BRIC nations are challenging the supremacy of the U.S. dollar but they are also capitalist nations and will not change power relationships.

16. Kim Ives, 'Haiti: Independence Debt, Reparations for Slavery and Colonialism, and International Aid', *Global Research, Haiti Liberté*, 10 May 2013, <http://www.globalresearch.ca/haiti-independence-debt-reparations-for-slavery-and-colonialism-and-international-aid/5334619>.

17. International Monetary Fund, 'Odious Debt', <http://www.imf.org/external/pubs/ft/fandd/2002/06/kremer.htm>.

18. Democracy Now, 'Exhaustive Study Finds Global Elite Hiding Up to \$32 Trillion in Offshore Accounts', 31 July 2012, http://www.democracynow.org/2012/7/31/exhaustive_study_finds_global_elite_hiding.

policy.¹⁹ Tax evasion and odious debt has enriched transnational corporations and the 1 percent while crippling the global economy. This is why austerity is a lie; this is why debt resistance is necessary to break the political and economic oppression created by deregulation and fraud.

Cities across France have started debt audits to uncover odious debt²⁰ and Argentina has just passed a law establishing a debt audit commission.²¹ However, debt resistance is just the first step, there are thousands of roads necessary to end capitalism but, as previously stated, ABS is focused on monetary policy. This is not to imply that this is more important than other strategies but to end capitalism we must control capital.

The transnational Participatory Budgeting movement is a different way to manage public money, and to engage people in the political process. It is a democratic process in which community members directly decide how to spend part of the public budget.²² ABS supports Participatory Budgeting, but ABS believes that we must look at the entire budget and combine debt audits with participatory budgeting. We must examine national, state/regional, and local government budgets and go beyond auditing odious debt to learn what portion of taxes is used in supporting corporations and monopoly practices. This would allow an accurate comparison between transnational corporate production and the cost of local production by worker coops and small businesses. However, the fact that corporate capitalism has created great inequities and is destroying the environment must be measured. And it should also be noted that emerging trends in technology favor small, customized production, with 3D printing as just one example.

Another parallel strategy would be the establishment of government or socialist banks. The Public Banking Institute is campaigning to create state banks similar to the Bank of North Dakota. The institute also support the reinstatement of U.S. Post Office banks that were terminated in the 1960s.²³ Though ABS supports the Public Banking Institute, there must be additional forms of redistributing the commonwealth. Former congressman Dennis Kucinich proposed a bill to nationalize the Fed titled the NEED Act, HR 2990.²⁴ This bill would have placed the Fed, which is owned and run by private bankers, inside the Treasury Department and replaced private bankers with civil servants. The goal was to take Wall Street's profits and turn them into a people's equity that would pay for health care, education and building local infrastructure.

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19. Jacques Leslie, 'The True Cost of Hidden Money A Piketty Protégé's Theory on Tax Havens', *The New York Times*, 15 June 2014, http://www.nytimes.com/2014/06/16/opinion/a-piketty-protoges-theory-on-tax-havens.html?ref=opinion&_r=0.
 20. Strike Debt, "'Don't Owe, Won't Pay!' A Conversation with a French Debt Resistor", 24 June 2013, <http://strike debt.org/publicdebt audits/>.
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 23. Records of the Post Office Department, <http://www.archives.gov/research/guide-fed-records/groups/028.html>.
 24. National Emergency Employment Defense Act of 2011 [NEED Act, HR 2990], <https://www.govtrack.us/congress/bills/112/hr2990/text>.



Fig. 11.1: Author in front of Federal Reserve Bank, FedUp action, Washington DC, March 2014.



Fig. 11.2: Author performing at New Museum for Pawel Althamer's "The Neighbors", a collaboration started at BB7, March 2014.



Fig. 11.2: Author and Harrison Tesoura Schultz in front of the New York Federal Reserve Bank, FedUp action, July 2014.

Again, ABS agrees with the NEED Act but advocates expanding its mission. The nationalized Fed should directly finance community-based infrastructure built by members of those communities. All transactions and policy decisions must be transparent and posted online. The goals should go beyond building and maintaining roads and schools to refitting existing structures for environmental sustainability. All buildings and homes should produce energy and be connected to a public national smart grid. Larger state owned green power generation could supplement local power generation. Of course the state and corporations say this would be too expensive but is that true? There are trillions of dollars in private, offshore accounts, and unknown amounts of money given as subsidies to transnational corporations. Add this to the cost of unending oil wars and the increasing damage from climate driven super storms. We are not limited by economics but by a failed political economy that protects existing class and economic structures.

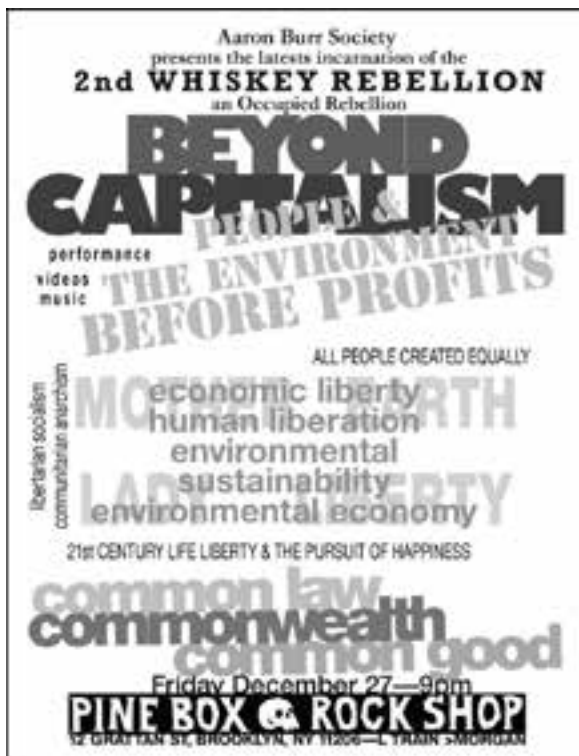


Fig. 12: Aaron Burr Society poster for performance series at Pine Box Rock Shop in Bushwick Brooklyn, 2014.

Every school child should be taught the relationship between governments and the different forms of monetary exchange and production, not only in theory but also as practiced in their communities. In addition to understanding budgets, this would empower people to make informed decision that are currently impossible. Psychologically this has the potential to reconnect those who have been disenfranchised and politically disengaged.

In his concluding lines of *Capital in the Twenty-First Century*, Thomas Piketty writes:

Yet it seems to me that all social scientists, all journalists and commentators, all activists in the unions and in politics of whatever stripes, and especially all citizens should take a serious interest in money, its measurement, the facts surrounding it, and its history. Those who have a lot of it never fail to defend their interests. Refusing to deal with numbers rarely serves the interest of the least well-off.²⁵

After the 2008 financial meltdown, the world is drowning in debt. Most of the debt in the industrial world was created by government deregulation and Wall Street fraud working in conjunction with corporate capitalism. In the Global South it is the legacy of colonialism and current neo-liberal policies. As oceans rise with global warming, drowning in debt is no longer a metaphor. If we want environmental sustainability our solutions must be global and based on economic justice with universal human rights. Though I assume Piketty would disagree, refusing to pay odious debt is the first step that will undermine oppressive political hierarchies, but we must also create new systems of global infrastructure from the ground up, outside of the control of the 1 percent and their corporations. Nationalizing the international banking system, while at the same time establishing regional and local public banks, could be one of many important steps toward building an equitable transnational green economy under a system of direct democracy.

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25. Thomas Piketty, *Capitalism in the Twenty-First Century*, trans. Arthur Goldhammer, Cambridge, MA and London: The Belknap Press of Harvard University Press, 2014.

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WILD, WILD WEST: A VIEW FROM TWO CALIFORNIAN SCHOOLMARMs

**BILL MAURER
AND LANA SWARTZ**

WILD, WILD WEST: A VIEW FROM TWO CALIFORNIAN SCHOOLMAMS

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People who work in payment innovation are really into the Wild West. Since 2008, when the industry started to heat up, we've heard them say, over and over again and across contexts, that 'it's a Wild West out there', or 'we are in the Wild West'. Sometimes they use it in marketing material, where it evokes the exciting, the new. Other times, they use it in terms of compliance, where it means that the legal or regulatory environment is murky, unsettled. Usually, these two discourses wind up being two sides of the same coin: the Wild West is a land of opportunity where anything goes and fortune favors those who can afford to take risks. That is, at least until the regulator shows up, the sheriff (or maybe the schoolmarm) riding into town.

The Wild West talk goes even further. Metaphors that are used in the payments industry to describe its networks and technologies often come directly out of 19th century Western expansion of the United States of America. There is talk of gold rushes, of land grabs, of railroads, of pioneers. It suggests something deeper: an unsettling of old allegiances, perhaps, an opening of new frontiers and the shaking loose of some of the conventions of person, property, state, and market.

Payment

'Payment' is conceptually and practically distinct from 'exchange'. Anthropology, the field to which at least one of us belongs, is built on notions of exchange. In the classic work *The Gift*, Marcel Mauss set forth the basic understanding that human sociality is solidified through various exchanges of one kind or another, of shells or money or other sorts of valuables or gifts or kin, ramifying social relations in enduring webs of obligation.¹ Through our research in the payments industry, however, we have had to rethink this exchange-centrism.

The payments industry is the set of business and government entities that facilitate the transfer of value from point A to point B any time you are not using cash or coin, that is, any time you're not using state-issued tokens representing fiat currency. From your employer to your bank account in the form of your electronic paycheck; from your credit card account to a merchant whenever you use a plastic card to pay for

1. Marcel Mauss, *The Gift: The Form and Reason for Exchange in Archaic Societies*, New York: W.W. Norton & Co., 1954.

something; from a person to another person when a sending electronic credits via text message in a mobile money service like Kenya's M-Pesa.

Payment is different from exchange. With exchange, there is usually a transaction in which people are equilibrating values. This is the old barter story. I've got some pigs, you've got some yams. We're going to exchange. We have to do a kind of calculation to figure out how many pigs for how many yams. Payment is a separate process: once we have decided how to calibrate the value of our items, how do I get the value that's embodied in my pigs over to you, and then get the value embodied in your yams over to me? It seems almost trivial. In the mythical barter situation, the payment infrastructure is our hands, the baskets in which we place the yams, the stick we use to herd the pigs. In a cash exchange, similarly, it is the hands that facilitate payment. I take cash in my hand. I give it to your hand. We have transferred value.

With non-cash payments, it's not so simple, or trivial. We need network infrastructures built, maintained, gated, and tolled by all the diverse players in payments: card networks, point of sale device manufacturers, payment processors, billing companies, wire services, application developers, mobile network operators, and government-mandated systems, too. Payments innovators are looking for opportunities in the transit of value. Some of them are looking for opportunities in the medium of exchange, too – to supplement or even replace state-issued currencies. Wild West indeed!

The Old West

Even when it is not overtly referred to, visions of the 'wild west' are summoned in many ways in today's payments industry. For example, the Visa network is routinely described as a set of 'rails', referring to transcontinental railroads that moved people, news, mail, currency, and gold across the widening United States and, in most grand narratives, consolidated it as a nation.

Eventually, in the actual Wild West, the actual rails were regulated as 'common carriers', private utilities operating in the public interest. Farmers, who depended on this new infrastructure to transport their goods to market and whose land had been ceded to build the rails, demanded universal service, freedom from price discrimination, and reasonable expectation of safe delivery. Regulation also arose to protect the nascent United States Postal Service, which was in competition with private express shipping cartels – who rode the infrastructure and colluded with the railroads and each other.

In the early 21st century, the language and principle of common carriage was ported onto telecommunication infrastructure. In the United States (at least at time of writing) and other countries, Internet Service Providers are obliged to treat all data equally, to not discriminate in terms of price or speed according to user, site, or platform.

But the most direct descendant of 'rails' is not the internet but the payments industry. By the start of the 20th century, the private expresses were threatened by competition from the telegraph, but they had already moved on to a new, lucrative, and unregulated way to move value: Money Orders for the poor, the immigrant, and the illiterate and Travelers' Checks for the elite. Crucially, the 'float' – the money left over

each month from checks not yet cashed – could be invested at interest. During World War I, the private express industry was nationalized. With little incentive to remain in the shipping business, the cartels officially consolidated as American Express and focused on their payments services and financial activities.² The modern payments industry was born.

No private infrastructure industry wants to be regulated as serving the public good. Railroads, private expresses, Western Union, and internet service providers have all resisted – with varied success – becoming a common carrier. No private rails want to be, as they put it in the telecom industry, a ‘dumb pipe’. All private rails seek rents and control. The payments industry is no different. Today – in internet and payment alike – the rents sought are increasingly not just fees but data. Personal and social data, to be used for the purposes of marketing and modeling, is described in the payments industry and beyond as ‘gold’, another Wild West throwback.

So, when we hear tell of new moneys built on data collection or its circumvention – be it American Express points or bitcoins – we think of ‘wildcat bankers’ who issued notes to pioneers backed by dubious reserves. We also think of a Twitter exchange by some of our payment industry interlocutors. One wrote of the current explosion of innovation in payments, ‘In a gold rush, you can mine for gold or sell shovels’.³ Another countered, ‘Or set up a bank’.⁴ Another offered, ‘You could sell treasure maps too. Today we call that consulting’.⁵ If we were wearing our capitalist black Stetsons instead of our schoolmarm bonnets, we might suggest that if they really wanted to be the winning robber barons in this metaphor, they might consider a railroad.

The Old Old West

There is another Wild West worth considering: the far west of the Achaemenid Empire that stretched from India to Anatolia under kings like Darius and Xerxes. Some of the world’s first metal coins come from the west of that empire, Lydia and Ionia in what is now Turkey. State authorities issued ancient coins bearing an image of the king – sometimes standing, sometimes kneeling; with a spear, or a bow and arrow. Yet users of those coins marked them with their own insignia, tiny counterstamps indicating what? The answer is not entirely clear. These were definitely not test cuts – gouges into a coin to ensure it was solid silver or gold. Many of the marks are intricate, delicate, beautiful abstract designs, small hands, lion’s paws.

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2. For a journalistic history of American Express, see Peter Z. Grossman, *American Express: The Unofficial History of the People Who Built the Great Financial Empire*, New York: Random House Value Publishing, 1987.
 3. @sammaule, ‘My tweet back in Oct: In a gold rush you can mine for gold or sell shovels. Nice shovel @obedier @GetPoynt #CGDigital.’ Twitter post, 4 November 2014, 6:28 AM, <https://twitter.com/sammaule/status/529641370638897152>.
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 5. @Greg_Coogan, ‘@dgbwrbirch @sammaule You could sell treasure maps too. Today we call that consulting.’ Twitter post, 4 November 2014, 7:10 AM, https://twitter.com/Greg_Coogan/status/529651859942678529.

Remember that the earliest moneys were not tokens but records, receipts inscribed on cuneiform tablets, more like contracts or letters of credit than cash or coin.⁶ These were also often held centrally, by religious or state authorities, in storehouses where grain or silver or tribute items might also be maintained. Did the early users of this new Wild West technology, the coin, feel compelled to write their own stories on them, mark their own debts and obligations? Or simply proclaim their status ('I have a scale, and I have weighed this coin. Here is my mark'). Such proclamation would suggest a world where rank trumps the kind of calculability we have traditionally associated with money tokens.

Perhaps those placing their marks on the early coins were still living in a ledger-based mentality, unfamiliar with the idea that there could be an unmediated means of exchange, a form of payment without an obvious infrastructure. Perhaps they did not fully understand that the coin could be a state issued, anonymous means of exchange that required no payment infrastructure other than the king's mints and the hands, bags, and maybe scales and weights of their daily exchange.

The state part of the story is important in this early history of coin, and it is what some payments innovators today are chafing against. For kings, like modern states, would exact taxes or tribute in their own token, an expression of political sovereignty that also exercised economic control. We think back to those marked coins, however, this desire to write, to make records. Because there is a growing awareness again today that money is nothing but records, after all. At least in some quarters. Not a commodity unto itself, but a database – a book of credits and debits, a statement of transactions.⁷

New Rails

If, in that Anatolian Wild West, people were inscribing on coins their own marks as if to re-make the coin into a kind of tablet, today among payments innovators, people are remaking the tablets. They are doing so, also, in a game of status and rank: against each other (Google versus Apple; Dwolla versus PayPal; Heartland versus FirstData; Verifone versus Ingenico), against the banks, and – crucially – against the states that still issue and warrant currency and mandate the fairness and function of some of the rails and provide oversight of all of them.

But banks and states are still important. Today in the United States, the Automated Clearing House facilitates more than 60 percent of non-cash payments by value (all those paychecks!), though debit cards account for almost 40 percent of non-cash payments by number of transactions (all those small purchases at the point of sale!).⁸ The ACH is a federally-mandated interbank network responsible for clearing and settling

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6. See Michael Hudson, 'The Development of Money-of-Account in Sumer's Temples', in Michael Hudson and Cornelia Wunsch (eds) *Creating Economic Order: Record-keeping, Standardization, and the Development of Accounting in the Ancient Near East*, Volume IV, Bethesda MD: CDL, 2000 pp. 303-330; and Geoffrey Ingham, 'Babylonian Madness: On the Historical and Sociological Origins of Money', in John Smithin (ed.) *What Is Money?* London: Routledge, 2000, pp. 16-41.
 7. This is a position long held by the economic anthropologist Keith Hart. See his *Memory Bank: Money in an Unequal World*, London: Profile, 2000.
 8. U.S. Federal Reserve, 2013 'Federal Reserve Payments Study: Recent and Long-Term Payment Trends in the United States: 2003-2012', *Summary Report and Initial Data Release*, Washington, DC, 2013.

transfers between bank accounts. The debit card networks developed from the automatic teller machine (ATM) networks built by the banks to make it easier and cheaper to get money to account holders.⁹

Payment innovators come from another place. Many of them come from the Wild West – at least as far as the American continent is concerned – the information technology, start-up culture, and venture capital associated with the northern part of the State of California: gold rush territory. Even VISA, now the most mundane of payment rails, was, in the 1970s, envisioned as a radical disruption by its San Francisco-based founder and feared by traditional bank executives.¹⁰ First PayPal in the late 1990s, and now ApplePay in 2014, a host of new companies have come into being since 2008 seeking to jump into payments.

Why? A convergence of inspirational stories, new possibilities, and one giant financial crisis. The mobile telecommunications provider Safaricom launched M-Pesa in 2008, a service that allowed Kenyans to send small amounts of money to one another via their simple mobile phones. It took the country by storm, and was widely reported in the tech and business media in the global North. And then there was the iPhone, Apple's foray into mobile telephony unleashing a burst of application development and a new business model, as well as revealing the possibilities of taking high-powered computing mobile. Why did the global financial crisis matter for payments? For one thing, it further eroded public confidence in banks: banking itself, as an overarching 'brand', suffered. For another, it actively pushed more and more people out of conventional banking and into alternative financial services – from pawnshops to check cashing services and payday lenders, as well as prepaid payment cards. Entrepreneurial folk looking at payments started to see opportunity in non-bank provision of money services. Among payments innovators, there was a palpable sense that anything was possible. Who needs banks? Who even needs money – the state kind, anyway?

New Territories

Much payment innovation is taking place in the domain of person-to-person payments, seeking an M-Pesa type service for the Global North, and purchases at the physical world point of sale, seeking an alternative to cash and cards at the merchant's till. The latter has been described to us as a 'last commons', an as-yet unfenced field of potential personal transactional data, ripe for 'mining'.

The payments game, in other words, is being played over databases: who shall collect, fence, own, leverage the commons of transactional data currently locked up in cash purchases? Who will bring purchase histories together with payment information together with locational, credit, social network, or other histories? David Stearns chronicles how fights between big merchants and the emerging card networks led to the development of different technological standards for inventory and payment.¹¹

9. See Tom Harper and Bernardo Batiz-Lazo, *Cash Box: The Invention and Globalization of the ATM*, Louisville, KY: NetWorld Media Group, 2013.

10. See David Stearns, *Electronic Value Exchange: Origins of the VISA Electronic Payment System*, New York: Springer, 2011.

11. David Stearns, *Electronic Value Exchange: Origins of the VISA Electronic Payment System*, New York: Springer, 2011.

The stores, using optical scanner technology, gained access to what consumers were buying, but only in their own shop or franchise. The networks, using magnetic stripe technology on plastic cards, could know levels of spending and locations, but would not get information on the details of each purchase. The legacy of this split endures: some payments innovators base their technology on optical scanning, generating QR codes or bar codes on mobile devices; others embed data-generating technology in the form factor of the device itself, with near-field communication chips. Wherever you see the former, be on the lookout for 'merchant' interests; where you see the latter, look for the card networks and the banks.

Imagine a great database, split in two: purchase data and payment data sundered. Some payments innovators want to reunify the database. Others – especially of the crypto-variety – seem to want to disperse it, massively replicate it so that no one entity can control it.

The empire's coin asserted state authority but freed people to trade, with no necessary centralized infrastructure. Yet people reinscribed status and rank and personality into those coins, perhaps advertising their own infrastructures for value – scales with which to weigh the metal.

The state's money reasserted political authority and the state's central banks affirmed the position of the state in monetary policy and banking. It also facilitated free exchange, with an infrastructure for producing and distributing cash but no central record of how that cash was being used. In the Simmel story, this is anonymized and de-hierarchized money. Viviana Zelizer, Jane Guyer, and others, however, have shown how people took that deracinated money and reinserted it into relations of rank.¹²

What is happening now? Centralized database owners vie with one another over ownership of new and vast transactional archives that are always in the making. Infrastructures are not just the sites of transfer of the information in those archives, but the sites of its production and capture. This is itself a kind of decentralization, into multiple databases.

New Politics

Michael Warner argued in *Letters of the Republic* that broadsides in early colonial America at first provided a representation of a God-given hierarchical natural order, with the King firmly ensconced at that top of that order.¹³ The Revolutionaries were different: they were, after all, trying to constitute a new kind of person through these letters: fellow citizens, whom they would hail as such. By hailing the person into a distributed horizontal community they would then constitute the Republican polity. If new payment systems are proliferating the records of transactionality for human beings, what kind of person and what kind of public are thereby being constituted? What's the nature of the database of all human interaction and transaction? Where is it? Who controls it?

12. Georg Simmel, *The Sociology of Georg Simmel*, trans. Kurt H. Wolff, Glencoe, IL: The Free Press, 1950; Jane Guyer, *Marginal Gains: Monetary Transactions in Atlantic Africa*, Chicago: University of Chicago Press, 2004; Viviana A. Zelizer, *The Social Meaning of Money*, Princeton: Princeton University Press, 1994.

13. Michael Warner, *The Letters of the Republic: Publication and the Public Sphere in Eighteenth-Century America*, Cambridge, MA: Harvard University Press, 1992.

Money can serve as an externalized memory of social transactions and relations.¹⁴ What we are seeing now is a kind of memory. One kind of decentralization is corporate. There is decentralization from the mass payment markets of the ACH, the card networks, and checks – with designs on cash. There is then a corresponding recentralization into closed corporate communities, to borrow wrongly an ethological phrase, of the payment innovators. Another decentralization is the distributed system represented by the Bitcoin blockchain, a massively replicated ledger, broadly and publicly shared, with a public whose speech is somehow concealed.

Payments today are a spaghetti of cables and wires and rails and portals and protocols. We are now seeing new linkages among these private infrastructures, private gateways between, say, ApplePay and American Express, or Braintree (the payment service behind almost all ‘sharing economy’ ventures) and PayPal. Virtually invisible, those private gateways may become sites of political concern. They are the recentralized, enclosed storehouses of our memories, our histories of interrelation.

We, two wild west schoolmarms, want to prod people – the payments innovators, the public, you, dear reader – to think anew about the interfaces and compositions among these types of systems. Regulators do this all the time, when they mandate interoperability between systems, and we benefit from it, even though it flies under our radar, because we ignore what company’s point-of-sale terminal we’re using to pay with whatever card we wish, and we can’t even see the Independent Sales Organization or the payment processor behind that terminal. There are switches and interchanges mandated to allow our money to ride these rails; there are tons of intermediaries in what seems like the simplest card swipe or PIN entry.

If we think about infrastructures or channels as closed political claims, payment innovation can be an unsettling of those claims, and the opening up of possible alternatives. The alternative can be liberating. Or, frankly, expensive or extortionist. We pay to pay every time we use a non-cash system. How will various forms of money-memory interoperate in a world no longer necessarily undergirded by the old narratives of nation, state, and economy?

How will the Wild West be won – and who will win it?

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14. Keith Hart, *Memory Bank: Money in an Unequal World*, London: Profile, 2000.

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MONEY TALKS: THE ENCLOSURE OF MOBILE PAYMENTS

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Much still depends on who owns and controls the networks, who sets the terms of entry, and who gathers and sorts [...] information and for what ends.¹

In parts of the Global South 2.5 billion people are excluded from financial services, but many of this number have access to mobile phones.² Where transacting at a distance was often difficult, involving long journeys and daisy-chain permutations of friends and acquaintances to move money from A to B, informal practices emerged involving the circulation of airtime as a kind of currency. Instead of using pay-as-you-go phone credit in talk, the top-up code is circulated as a text message to a recipient as a remittance, payment or gift, or even retained as a form of savings. Airtime, traditionally a unique commodity that represents the capacity to communicate and cooperate with others, now also fulfills many of the functions of money. Mobile phones are used to enable not only wireless communications, but also the manipulation, transfer, and store of value.

For anthropologist Bill Maurer, airtime trading reveals the creative instability of money in a digitized context. Airtime performs as a commodity in one instance, as a communications channel in another, and as a system of payment, means of exchange, and store of value when it is used as an alternative currency.³ It continually moves between states of communication and transaction in ways that are plural and mutable.

Airtime is a bottom-up phenomenon; before established mobile SMS payment systems such as M-Pesa, informal practices around airtime sharing and exchange were documented in different countries. In an anthropological study of money in Afghanistan, Chipchase and Lee describe the role of airtime in the development of love marriages, where 'common dating etiquette [...] has the male suitor sending airtime credit to the woman he likes, and if necessary, purchasing a basic phone for her'.⁴ While this suggests a gift economy of sorts, airtime also operates as a de facto currency. Pre-paid minutes can be exchanged for cash or spent in shops in places such as Cote

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1. Mark Andrejevic, 'Surveillance in the Digital Enclosure', *The Communication Review* 10.4 (2007): 300.
 2. Jeremy Allaire, 'Instant, Free and Secure: New Standards for Global Consumer Finance', Bitfin Conference, Dublin, 3-4 July 2014.
 3. Bill Maurer, 'Mobile Money: Communication, Consumption and Change in the Payments Space', *Journal of Development Studies* 48.5 (2012).
 4. Jan Chipchase and Panthea Lee, 'Mobile Money: Afghanistan', *Innovations* 6.2 (2011): 27.

d'Ivoire, Egypt, Ghana, Uganda, and Nigeria. In Zimbabwe, where American banknotes have replaced the hyperinflation-ravaged Zimbabwean dollar, airtime transfers sometimes take the place of small transactions in the absence of readily available coinage.⁵ Shopkeepers frequently give airtime instead of change in transactions.⁶ As the system has scaled up, agents on the ground have come to act as cash-in/cash-out points for the network, transforming paper money into airtime and back again. Alongside these practices, the use of airtime as a form of international remittance is also significant, with companies such as Ezetop and Transferto conducting airtime transfers for more than 350 operators in over 100 countries via the web. The value of these international remittances via mobile phones surpassed \$10 billion U.S. Dollars in 2013.⁷

Practices like airtime trading are significant because they imagine new kinds of money outside of state-backed currencies as well as new ways of transacting outside of (or in the absence of) publicly mandated systems. Like other sociotechnical experiments in money such as cryptocurrency and cryptoequity, they also point to creative evolutions in the substantiation of value going forward. Money is socially produced, these practices suggest, and could be produced differently. And where access to mobile communications is in the hands of many, such alternatives may be easier to mobilize. We might take money and the means of creating money into our own hands. In this early stage, however, it's also important that we think about how the politics of the platforms and systems that we now transact on and possibly use to create or circulate a 'different kind of money' will also shape those ambitions going forward.

The Infrastructural Base of Mobile Communication

The practice of airtime trading is now so ubiquitous that it has led to anxieties about the use of phone credit as an unregulated form of money. Network operators in such a scenario are not only provisioning communications services, some argue, but also 'issuing their own currency' and defining its exchange rate.⁸ Instead of a state-backed currency, airtime trading transfers the control of money from banks to network incumbents. The money in question – airtime circulated as a currency – is guaranteed and produced by the infrastructure of mobile communications.

When we talk of airtime, therefore, we are speaking about a commodity and a currency that is brought into being alongside the economic enclosure of the wireless spectrum. 'Spectrum' describes the electromagnetic frequencies used for all forms of mobile and wireless communication, from radio and television networks to cellular networks, nearfield communications, and the mobile internet. Electromagnetic spectrum was initially recognized as a 'commons': nobody was thought to own the airwaves anymore than anybody might be thought to own the air itself and anyone with the necessary equipment could use radio waves to transmit messages. In the early decades of the

5. See <https://www.econet.co.zw/services/airtime-transfer>.

6. Paul Nyakazeya and Bernard Mpofu, 'Econet Phone Tokens Used as Change', *The Independent*, 27 May 2010, <http://www.theindependent.co.zw/2010/05/27/econet-phone-tokens-used-as-change/>.

7. 'In the Shadow of Mobile Money: International Airtime Remittances', *Mondato*, 28 May 2014, <http://mondato.com/blog/airtime/>.

8. 'Airtime is Money', *The Economist*, 19 January 2013, <http://www.economist.com/news/finance-and-economics/21569744-use-pre-paid-mobile-phone-minutes-currency-airtime-money>.

20th century, however, the first radio acts declared spectrum to be a scarce resource in need of licensing. Subsequent decades saw the deregulation of wireless and the introduction of spectrum auctions, where frequency bands are sold at exorbitant prices to the highest bidder. These auctions are higher-level transactions in airtime. And while mobile operators don't exactly trade spectrum like cash, a spectrum license represents 'the true currency of wireless operators'⁹ counting for as much as 80 percent of a company's total net worth.¹⁰

As digital computation migrates to mobile and pervasive environments, becoming reliant on spectrum-based networks, this resource is increasingly significant. Spectrum is currently amortized over a period of 10 to 40 years and in accordance with a calculation known as megahertz-pop (MHz-pop), representing the population in a license area multiplied by bandwidth.¹¹ At the heart of this value, in other words, are the communicative, cognitive, and cooperative capacities of a network of users, our everyday acts of attention, transaction and sociality. It is this enclosure of the spectrum commons that facilitates the operation of airtime as a de facto currency. This is what lends spectrum its intrinsic value and underpins airtime as money. Airtime trading might be a bottom-up phenomenon that re-imagines money in situations where trust in banks and public authorities is at an all-time low, but it also builds and transacts within other control systems and forms of enclosure in communication networks.

The practice of airtime trading refers to the enclosure of radio space, but also to new forms of enclosure where the political economy of payment systems and network communications intersect. The infrastructures for payments, traditionally a public resource or commons¹² are being enclosed in new and troubling ways in the mobile space. These new systems for value-transfer inherit constraints and affordances from the protocols and standards of the communications 'rails' they ride on.¹³ They encode geographies of access as well as particular relations of production and property. How will the political economy of mobile network infrastructure – from handsets through to core and radio access infrastructure – shape the geography of access in the mobile payments space and, in turn, the future of money?¹⁴

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9. A.M. Seybold, 'Seybold's Take: Spectrum is the True Currency of Wireless Operators', *Fierce Wireless*, 22 June 2012, <http://www.fiercewireless.com/story/seybolds-take-spectrum-true-currency-wireless-operators/2012-06-22>.
 10. Robert J. Dippelsman and Nils Ø. Mæhle, 'Treatment of Mobile Phone Licenses in the National Accounts', *Review of Income and Wealth* 49.3 (2003): 373-393.
 11. Coleman Bazelon, 'The Economic Basis of Spectrum Value: Pairing AWS-3 with the 1755 MHz Band is More Valuable than Pairing it with Frequencies from the 1690 MHz Band', *The Brattle Group*, Washington DC: International Telecommunications Union (ITU); *Exploring the Value and Economic Valuation of Spectrum*, ITU, 2012, http://www.itu.int/ITU-D/reg/broadband/ITU-BB-Reports_SpectrumValue.pdf.
 12. Bill Maurer speaks about payment as the last commons in 'Regulation as Retrospective Ethnography: Mobile Money and the Arts of Cash', *Banking and Finance Law Review* 27.2 (2012): 307.
 13. Ignacio Mas and Dan Radcliffe, 'Mobile Payments Go Viral: M-PESA in Kenya', in P. Chuhan-Pole and M. Angwafo (eds) *Yes, Africa Can: Success Stories from a Dynamic Continent*, World Bank Publications, 2011.
 14. As Star reminds us, 'optical fibers run along railway lines; new systems are designed for backward compatibility; and failing to account for these constraints may be fatal'. Susan Leigh Star, 'The Ethnography of Infrastructure', *American Behavioral Scientist* 43.3 (1999): 382.

Enclosure in Digital Networks

Enclosure in digital networks amounts to rights to control access, to exclude, and to extract benefits from communications. Network operators, service providers, equipment manufacturers, developers, and media conglomerates currently hold these privileges. Users do not. The term 'enclosure' has a double valence in this context. On one hand it refers to the alienation of users from the means or conditions of some element of production. As already discussed, the enclosure of spectrum makes it illegal to set up an unlicensed radio station or GSM network and users are forced instead through proprietary channels. On the other hand, 'enclosure' alludes to the active construction of a productive space in which these tools and capacities may be redistributed to users, now bounded in such a way as to control value and mediate production. Andrejevic embraces this model of enclosure when he describes: 'the construction of privately owned and operated interactive enclosures that serve to separate users from the means of interaction, transaction, communication and expression'.¹⁵ Rights to the production and circulation of information are appropriated and filtered through administrative channels, at which point they are once more distributed as part of the services corporations must deliver to users in order to ensure their productivity. In other words, we are given access once more to communications but this access is mediated by commercial interests who have established themselves as 'rentiers' of the network.

Rent arises because social actors can realize an enhanced income stream, over an extended period of time, by virtue of their exclusive control over some directly or indirectly tradable item.¹⁶ Simply through controlling the pipe a corporation can extract a rent from the user.¹⁷ New forms of rent are increasingly generated in this digital space, such as the rent over the attention economy performed by web advertising, or the rent of internet service providers (ISPs) over bandwidth, and mobile network operators over electromagnetic spectrum. Direct forms of rent trade expressly on access to an element of production; such as when an operator establishes a monopoly on infrastructure, bandwidth, software or platforms. Indirect rents, in contrast, result when actors trade, not on the resource itself, but on the commodities and services that may be expropriated through its use, such as from advertising revenues or through speculating on future uses. In the case of indirect rents, the value is 'socially produced'; it is the sum total of users and their communicative and cooperative acts.¹⁸ An example of this is revenue earned by ISPs, and platform providers when they establish a monopoly over users, content, data, and social networks. The rent extracted in this context is a payment in attention, information, or affiliation, which in turn can be sold to advertising companies and market researchers who require

15. Mark Andrejevic, 'Surveillance in the Digital Enclosure', 2007, p. 304.

16. David Harvey, 'Labor, Capital, and Class Struggle Around the Built Environment in Advanced Capitalist Societies', *Politics & Society* 6.3 (1976).

17. Rent is the income that can be extracted from exclusive ownership of a resource, where value is contingent on its availability with respect to demand. It constitutes a credit title or control of some immaterial or material asset that grants the right to draw benefit from a position that operates outside of production. It is unearned income.

18. Robert J. Dippelsman and Nils Ø. Mæhle, 'Treatment of Mobile Phone Licenses in the National Accounts' *Review of Income and Wealth* 49.3 (2003); System of National Accounts (SNA), *System of National Accounts 2008*, New York, <http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf>.

access to users, their content, and their networks. Rent in this context has become less about charging for access to a resource and more often about leveraging the value produced when this access is (re)distributed to users in some mediated form. Income from user-generated data and content turns out to be a lot more profitable than a straightforward rent on the bit-pipe alone. Why accept a straightforward fee for a resource when you can access far greater streams of value by making everything free and accessible?¹⁹

To achieve this, enclosure in mobile networks oscillates between access and control. Access to information services become mobile, ubiquitous, or 'everyware'; but this access is mediated, monitored, and controlled by a commercial entity. Today, we participate in these enclosures in a variety of ways: when using software applications supplied by third parties; through cloud storage facilities; through managed device platforms such as mobile phones, smart phones, e-readers, tablets, and music players; through social media networks; and through online databases and search engine queries.²⁰ We are also participating in them when we trade and transact over our mobile devices. All these enclosures rely on proprietary resources such as storage and processing facilities, core infrastructure, base station controllers, satellites, radio access infrastructure, and crucially, the 'privileged protocol' through which transmissions are performed: electrical and optical cables, and the electromagnetic frequencies used for wireless transmissions.²¹

Money is Both a Token and a Rail

It should be clear that we need to think about the ways in which existing systems of enclosure and value capture in networks will shape the future of payment as money migrates to mobile. What kinds of systems are emerging as banks and telecommunications intersect?

Speaking on 'Closed Loops and Private Gateways: Money, Technology and the Public Interest in Payment' at the MoneyLab conference in Amsterdam, Bill Maurer made an invaluable distinction between money as a 'token' and money as a 'rail', or between money as *information* and *infrastructure*.²² The monetary token represents the network of social relations that makes it possible for money to represent the value of all other commodities. Through pricing information, the token materializes a collective consensus about value and the social construction of equivalence between things and their relations to other things in exchange. In order to acquire a commodity, I hand over a token, where price describes the units that I must present in exchange for goods or services. This might be an official bit of paper with instructions on it, or a coin, data in a ledger, or the public keys used to undersign cryptographic transactions.

19. I've written in more detail about this phenomenon elsewhere. See Rachel O'Dwyer and Linda Doyle, 'This is not a Bit-pipe: A Political Economy of the Substrate Network', *The Fibreculture Journal* 20 (2012): 10-32.

20. Paul Jaeger, Jimmy Lin, Justin M. Grimes, and Shannon N. Simmons, 'Where is the Cloud? Geography, Economics, Environment, and Jurisdiction in Cloud Computing', *First Monday* 14.5 (2009), <http://pear.accc.uic.edu/ojs/index.php/fm/article/view/2456/2171>.

21. Alexander R. Galloway, *Protocol: How Control Exists After Decentralization*, London: MIT Press, 2004, p. 11.

22. Bill Maurer, 'Closed Loops and Private Gateways: Money, Technology and the Private Interest in Payment', MoneyLab Conference, Amsterdam, 21-22 March 2014, <http://vimeo.com/90207123>.

But money is not just untethered information; it also includes the rails or infrastructures that support these flows. Infrastructure is what circulates or moves money, but it is also what holds it together, in that infrastructures also produce and guarantee money as a means of exchange, as a unit of account, and as a store of value. These infrastructures are multiple. Where historically this refers to the introduction of institutions such as the Federal Reserve and the Central Bank to guarantee currency, today we encounter conditions where our telecommunications and network service providers are emerging as veritable financial institutions with control over the informational content of money but also over where and to whom that information flows.²³ We might say that while the 'token' is socially produced, the 'rail' is consolidated in material, infrastructural, and juridical limitations that continue to constrain our ability to control money or to produce it differently.

Today network infrastructure is at the apex of monetary circulation in both wired and wireless networks. Internet protocols are integral to wired payments. Channels such as Short message Services (SMS), Unstructured Supplementary Service Data (USSD) messages, Near Field Communications (NFC), Quick Response (QR) codes, and third party gateway applications all play a role in mobile money transfer and form the rails on which our money now rides. The role of telecommunications in money transfer becomes even more significant when we consider that new forms of electronic payment and currency obfuscate easy distinctions between the informational token transferred, the data produced by the transfer, and the architectures and infrastructures that support it. Airtime, as previously discussed, produces a self-referential token guaranteed by the intrinsic value of the spectrum-based 'rails' on which the currency travels. So too, cryptocurrencies such as Bitcoin collapse the distinction between the token as a verification process in the blockchain and the peer-to-peer infrastructure that supports, produces, and circulates money. On the flipside, the data artifacts of our online activities are now not only monetizable, but are coming to act as currencies of a sort, as the previously latent traces of our movements, interests, and social interactions may be used to pay for services.²⁴

23. Historically there are lots of different telematic infrastructures involved in circulating money and price information in the past 150 years. Kavesh, Garbade and Silber identify the role of the telegraph in reducing stock market price differentials between New York and geographically dispersed regional markets in the 1860s. On a global scale, the construction of transatlantic cables was crucial to the development of securities trading between major global cities such as New York and London. The postal service has played a role in money transfer since the 1880s, with the Austrian Postal Giro implementing an alternative retail transfer system utilizing this existing distribution channel in 1883. So too, the American Express Company (AmEx), now a financial services corporation, started as an express mail service that rivaled publicly mandated systems for control of money orders. Telephone exchanges and telegraph systems have also formed an infrastructural base for transactivity since the 1870s when Western Union, originally a telegraph company, introduced its first wired money transfer service. This relied on a million miles of telegraph lines and two international undersea cables. Similarly, telephone exchanges were in use between banks and customers as early as the 1890s. Transactivity over computer networks began with the development of National Giro Centre in 1968, designed at the time to compete with the post office as a form of remittance. From the mid-1960s onwards, we see the emergence of widespread telematic infrastructures for transactivity, and with this, a gradual blurring of the demarcation between banks and non-financial communications intermediaries.

24. David Zax, 'Is Personal Data the New Currency?' *MIT Technology Review*, 30 November 2011, <http://www.technologyreview.com/view/426235/is-personal-data-the-new-currency/>.

And yet, while roads, airports, ports, highways, spectrum, copper or fiber-optic cables are significant to money and where it travels, it is worth noting that there is also a strong sociality to the infrastructures of payment. The most significant form of infrastructure that money relies on is still social. Money rides networks of trust, reputation, and relationality. Remittance networks often involve moving money in an episodic fashion through a network of human peers. Informal value transfer systems that operate in unbanked spaces, such as Hawala networks in the Middle East and North Africa also transact through already existing social channels that can transmit meaning and communication, but also economic value.²⁵ Formalized banking structures continue to leverage a degree of social capital.²⁶ Telematic networks often build onto these already existing social channels. This is explicit in examples such as airtime trading and mobile money, where agents on the ground are theorized as ‘bridges to cash’ or ‘human ATMs’.²⁷ It is also obvious in new forms of cryptocurrency such as Ripple and Document Coin that transact on individual reputation and network affiliations.²⁸ These rails are never purely instrumental; they are always sociotechnical.

Enclosure of the Payments Space

Instead of information and communication technologies supplementing financial operations, telecommunications operators, and particularly those supporting wireless communications, they are emerging as veritable financial actors in their own right.²⁹ This trend is particularly obvious in the Global South, where wireless services are more easily provisioned than both financial services and wired communications. Telecommunications companies are now acquiring banking licenses and traditional banks are partnering with operators or in some cases acquiring their own radio licenses to roll out financial services over mobile networks.

While airtime-trading initially existed as a common good (albeit one implemented on proprietary network infrastructures), major industry consortia such as the Global System for Mobile Communications Association (GSMA), and the World Bank’s International Finance Corporation (IFC) are now looking to harness these practices as a means of financial access to the worlds ‘unbanked’ or ‘underbanked’ communities.³⁰ According to the GSMA MMU Deployment Tracker, there are currently 246 ‘mobile money’ deployments, with a further 113 planned.³¹ Among the most notable of these

25. International Finance Corporation (IFC), ‘Mobile Money Study 2011’, <http://www.ifc.org/wps/wcm/connect/fad057004a052eb88b23ffdd29332b51/MobileMoneyReport-Summary.pdf?MOD=AJPERES>.

26. Describing a pre-computational banking period from 1864-1945, Batis-Lazo and Wood demonstrated the necessity of trust relationships between customers and banks in this period, with bank managers occupying a position of reputation and standing in their communities: Bernard Bátis-Lazo and Douglas Wood, ‘An Historical Appraisal of Information Technology in Commercial Banking’, *Electronic Markets* 12.3 (2002).

27. Bill Maurer, Taylor C. Nelms, and Stephen C. Rea, ‘Bridges to Cash: Channeling Agency in Mobile Money’, *Journal of the Royal Anthropological Institute* 19.1 (2013).

28. See <https://ripple.com> or Klint Finley, ‘Document Coin: A New Currency whose Value is Based on your Reputation’, *Wired Magazine*, 18 July 2014, <http://www.wired.com/2014/07/document-coin/>.

29. Wouter Rosingh, Adam Seal, and David Osborn, ‘Why Banks and Telecoms must Merge to Surge’, *Strategy + Business* 23 (2001), <http://www.strategy-business.com/article/17163?gko=4cda6>.

30. See <http://www.gsma.com/mobilefordevelopment/category/mobile-money-for-the-unbanked>.

31. MMU Deployment Tracker, <http://www.gsma.com/mobilefordevelopment/programmes/mobile-money-for-the-unbanked/insights/tracker>.

are Kenya's M-Pesa, GCash in the Philippines, and Digicel's Tchocho in Haiti, large scale mobile money transfer systems that scale airtime trading, using SMS to transfer money with agents on the ground acting as cash-in and cash-out points in the network. M-Pesa now also offers domestic peer-to-peer transfer, bill payment services, and other forms of bulk payment, merchant payment, international remittances, loan disbursement, and repayment links to other banking products. Econet Wireless in Zimbabwe is now offering 'EcoCash loans' to their mobile customers, microloans that are deposited to the user's phone. Today, with mobile money services, telcos such as Digicel, Econet Wireless, and Safaricom are de facto banks in their respective jurisdictions. On the other side of the equation, Equity Bank, Kenya's largest financial institution, has recently applied for a license to become a Mobile Virtual Network Operator (MVNO).³²

Opinion moves between a recognition of formal mobile money services as a necessary social good that gives security, safety, independence, and mobility to users, and a perspective that recognizes these services as expanding financial enclosure to the world's poorest communities and extracting additional rents in the process.³³ A significant market exists for new communications infrastructures for global and domestic remittances.³⁴ Additional revenue can be made by financial institutions and mobile network operators who insert themselves as commercial intermediaries in the monetary exchange, mediating access to communications and charging transaction fees. Transaction charges may not individually represent a lot of money, but cumulatively they produce a significant and fairly constant fee-based revenue source when they reach scale.³⁵ For an indication, Safaricom, the mobile operator that offers M-Pesa, reported mobile money revenues of Kshs 26.56 billion for 2013-2014.³⁶

Extracting these rents requires a further enclosure of the channels that support transactivity – in this case, radio access infrastructure and the electromagnetic spectrum that allow for communications. It's true that mobile money justifies greater investment in universal service provision, a development that may have positive social and economic consequences for developing countries because it supports investment in communications infrastructure and wide area network coverage. However, the growing

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32. Muthoki Mumo, 'Equity Bank Seeks Share of Telco Business', *Mobile Nation*, 25 February 2014, <http://mobile.nation.co.ke/lifestyle/Equity-Bank-seeks-share-of-telco-business/-/1950774/2220608/-/format/xhtml/-/rbrem7z/-/index.html>.
 33. See Kevin Donovan, 'Mobile Money, More Freedom? The Impact of M-PESA's Network Power on Development as Freedom', *International Journal of Communication* 6 (2012); Erin Taylor, 'Mobile Money and the 'Social Good' of Global Financialization', MoneyLab Conference, Amsterdam, March 21-22 2014, <http://vimeo.com/90208804>.
 34. International remittances currently amount to 581 billion a year. According to the WB, remittances to developing countries are to stay robust this year, despite increased deportations of migrant workers, *World Bank*, 11 April 2014, <http://www.worldbank.org/en/news/press-release/2014/04/11/remittances-developing-countries-deportations-migrant-workers-wb>.
 35. Kevin Donovan, 'Mobile Money for Financial Inclusion', *Information and Communications for Development* 61 (2012); Bill Maurer, 'Mobile Money: Communication, Consumption and Change in the Payments Space', *Journal of Development Studies* 48.5 (2012); Jake Kendall, Bill Maurer, Phillip Machoka, and Clara Veniard, 'An Emerging Platform: From Money Transfer System to Mobile Money Ecosystem', *Innovations: Technology, Governance, Globalization* 6.4 (2011): 49-65.
 36. Arunjay Katakam, 'Annual Reports Show Mobile Money Remains a Strategic Priority for MNO Groups', *GSMA*, 19 June 2014, <http://www.gsma.com/mobilefordevelopment/annual-reports-show-mobile-money-remains-a-strategic-priority-for-mno-groups>

demand for mobile bandwidth that mobile money represents also invites arguments for the privatization and deregulation of infrastructural development.³⁷ There is not a lot of potential to build or scale an alternative nonproprietary infrastructure; instead, the powerful network effects of commercial services such as those offered by Safaricom displace alternatives and make commercial enclosure almost impossible to resist.³⁸

Scaling a commercial remittance network also necessitates the enclosure of the interpersonal forms of trust and sociality that support the culture of mobile payment systems at a local level. Mobile money *encloses* human sociality because it leverages the networks of trust already existing between the money agents and their customers, and workers and their families. For money to flow, users on the ground must trust in their agents and agents in each other. This human network forms a necessary part of the infrastructure of money transfer, and yet some links in the system may be unrewarded or even degraded by the technical transfer systems they help to support. When social agents become economic agents, this is also thought to flatten and displace discrete and localized transactivity, undermining the social capital that existed prior to mobile remittances such as face-to-face microfinance institutions and informal and episodic remittance networks between friends and families.³⁹ In this way, while mobile money requires social infrastructures, it also potentially undermines the social institutions necessary for the functioning of exchange.

Mobile money practices are also emerging in the Global North, albeit with a different customer base and revenue model. While services in the Global South largely depend on SMS and USSD channels for executing transactions, smartphones provide more possibilities for payment, with mobile network operators and third parties producing mobile wallets and NFC or QR code based applications for e-payments on the go. Alongside network operators, ISPs such as Google and Facebook are also entering this space.⁴⁰ Device manufacturers also have a hand in it, with payment solutions forming an integral part of the iPhone 6 and anticipated to replace the magnetic strip interface of the credit card in the near future.⁴¹

Telecommunications companies in the Global North are under a lot of pressure to justify their investment in next generation networks and spectrum. Expanding to additional financial services such as mobile money transfer and mobile wallets represents another possible value chain and the opportunity for a broader customer base for the

37. Bill Maurer, Taylor C. Nelms, and Stephen C. Rea, 'Bridges to Cash: Channeling Agency in Mobile Money', *Journal of the Royal Anthropological Institute* 19.1 (2013); Bill Maurer, 'Regulation as Retrospective Ethnography: Mobile Money and the Arts of Cash', *Banking and Finance Law Review* 27.2 (2012).

38. Kevin P. Donovan, 'Mobile Money, More Freedom? The Impact of M-PESA's Network Power on Development as Freedom', *International Journal of Communication* 6 (2012).

39. Nick Hughes and Susie Lonie, 'M-PESA: Mobile Money for the "Unbanked" Turning Cellphones into 24-hour Tellers in Kenya', *Innovations* 2.1-2 (2007); Ignacio Mas and Olga Morawczynski, 'Designing Mobile Money Services: Lessons from M-PESA', *Innovations* 4.2 (2009).

40. 'Facebook seeks Irish Approval for New Money Service', *Irish Times*, 14 April 2014, <http://www.irishtimes.com/business/sectors/technology/facebook-seeks-irish-approval-new-for-e-money-service-1.1760908>.

41. Jon Delano, 'Swiping iPhone 6 May Soon Replace Credit Cards', *CBSLocal*, 10 September 2014, <http://pittsburgh.cbslocal.com/2014/09/10/swiping-iphone-6-may-soon-replace-credit-cards-cash/>.

incumbent, particularly when some of their other sources of income are now shared with highly competitive service and content providers. Here the value chain extends beyond transaction fees for payment infrastructure to the value of payment information. Just as in other kinds of digital enclosure, we can identify a shift from direct forms of rent that trade on the infrastructure itself towards indirect forms of rent that trade on forms of voluntary or unconscious production in online spaces.

A direct rent occurs when an operator extracts a monetary fee in return for processing a financial transaction. As we saw with mobile money in the Global South, rent takes the form of a transaction fee as a percentage of the overall remittance. In the Global North, however, much of the rent now accumulates at a different degree of exploitation. This is not so much a toll on the pipe itself, but on the data produced by users at the point of transaction. Such an approach responds to diminishing returns in dumb infrastructure,⁴² but also, as Maurer points out, to recent legislation to limit and regulate transaction fees.⁴³ Companies now propose the 'data of payments' as the root of a more valuable and defensible business model independent of monetary fees.⁴⁴ As society goes cashless, 'payment companies will have a larger business, and a more valuable one, in closing the loop for offline transactions and helping deliver customers' to advertisers.⁴⁵ Through the point of purchase by way of any non-cash medium we contribute transactional data. From a user's perspective, it's not that the question of the toll or rent disappears from the equation, but that the cost of transacting is exacted in the currency of personal data and privacy itself, which in turn can be aggregated, exchanged, and readily (re)monetized by commercial actors.

The effects of this enclosure are far-reaching. The most obvious is the introduction of targeted advertising and location-based services informed by transaction histories. Here mobile payments are doubly commodified, first when consumers are constructed as hyper-segmented markets and sold to advertising clients, and second when the user-generated data of payments are extracted in order to refine and precision future commercial messages. In virtualizing money, non-cash payments materialize previously latent informational traces of who transferred money to whom and in exchange for what. The managers of the bit-pipe can monetize these traces, but there are other far-reaching effects to the wealth of data from consumer transactions. Speaking on the emergent effects of consumer metadata in 2014's Transmediale Festival, big data theorist Kate Crawford identified implications beyond being pushed unwanted recommendations or location-based services. Instead Crawford illustrated how monitoring purchasing information underpins new forms of governmentality in both online and offline spaces. The effects of such scrutiny will be unevenly distributed; for example,

42. As telecommunications economist Jan Dawson explains, traditional telecommunications providers can no longer afford to provision mobile network infrastructure through a pay-per-use model alone because of a law of diminishing returns; instead it is necessary that they adopt a business model that not only supports social production through mobile networks, but also leverages the value of user-generated content to expand their revenue. 'Telecoms in 2020: A Vision of the Future', *Emerging Communications Conference & Awards: What's Next in Telecom, Mobile & Internet Communications*, San Francisco, 2011.

43. Bill Maurer writes about the impact of the 2011 Durbin Amendment in 'Late to the Party: Debt and Data', *Social Anthropology* 20.4 (2012): 474.

44. Alex Rampell, 'Payment Data is More Valuable than Payment Fees', *Tech Crunch*, 10 August 2012.

45. Rampell, 'Payment Data'.

individual purchase tracking of low-income families or of individuals who have claimed bankruptcy or insolvency.⁴⁶

Conclusion

The forces governing information are coming to govern value, and vice versa. Networks are no longer a subset of political economy; the politics and governance of networks are now central to financial capital. Existing enclosures in mobile networks are leading to new forms of value capture when payments migrate to digital media. At the same time, the emergence of digital payments provides justification for an even greater enclosure of information and communication technologies, under the guise of necessary private investments for 'social good' or requisite security and regulation for new payment channels. If we want to produce a different kind of money we need to think not only about the informational content of money and who produces it and how, but also about the various gateways and chokepoints that constrain the possibility of a money that might be held, produced and circulated in a way that socially and economically benefits people who normally don't have a lot of financial security or control. Because what we have instead are monetary forms that enclose users at every turn, first through debt and second through the necessity of waged work and unwaged digital work.

In the face of these widespread enclosures we need to maintain the possibility of our communications and our exchanges with each other as a commons, as something we all work to produce, and over which we should have some degree of autonomy, ownership, and control. One point of focus is that if digital and monetary enclosures are coalescing, the spaces and sites of resistance and struggle within networks might also be fruitful sites for radicalizing or open sourcing money in the near future.

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46. Kate Crawford, 'The Uses and Abuses of Big Data', *Transmediale Conference*, Berlin, 29 January - 2 February, 2014.

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MOBILE MONEY: FINANCIAL GLOBALIZATION, ALTERNATIVE, OR BOTH?

ERIN B. TAYLOR

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Mobile money, and indeed microfinance generally, seems to generate strong opinions. After giving a presentation about mobile money in Haiti at the MoneyLab conference in March 2014, an audience member asked me a loaded question that stopped me in my tracks. 'But according to what I've read, mobile money has pretty much failed everywhere,' he said, 'Do you think that's true for Haiti?'

My mind flashed back to a thousand memories from my fieldwork in Haiti: women receiving conditional cash payments from Mercy Corps via Voilá's mobile money service; T-Cash, in Saint Marc; vendors paying the rent on their market stalls in Port-au-Prince via Digicel's TchoTcho Mobil; my friend and assistant Emmanuel, who lives on the Dominican side of the border with Haiti, receiving money from his cousin to pay her Sky television bill; many others who use their mobile money accounts as a safe place to store cash.

How do you judge the success of mobile money? Success according to whom? In a conference about financial alternatives, 'success' is a slippery subject. It might mean rapid uptake, giving millions of users access to formal financial tools for the first time. But it could also mean the exact opposite: mobile money is a way of incorporating people into the formal global financial system, and many people at this conference were present to discuss ways of opting out of this very system.

For the users described above, the question of whether mobile money is useful is far more relevant than whether mobile money is successful. Like mobile phones, and unlike many other financial services in Haiti, mobile money is available and affordable. Haitians use mobile money on a daily basis, along with a range of other formal and informal services, to solve a range of concrete problems that were previously more difficult, time consuming, and expensive using informal or overpriced services. They don't tend to worry too much about whether using mobile money will improve their economic condition or contemplate the implications of joining the world of formal finance. Given that the majority of the financial services they use are informal, and therefore alternative by definition, they don't have the luxury of being able to dream of ways to opt out of using fiat money, such as by buying and spending bitcoins.

However, in considering this question from the conference audience, I was acutely aware that users aren't the only people to whom mobile money is useful. In fact, during my time in Haiti I repeatedly got the impression that the usefulness of mobile money

to citizens was far outweighed by its usefulness to development organizations, companies, and government. While much of the hype around mobile money is generated around the potential of mobile money to facilitate financial inclusion for 2.5 billion 'unbanked' people, the people creating the hype are generally not those end users. In fact, while mobile money deployments are growing at a rapid rate, and its user base steadily increasing, it has seen nothing like the viral uptake that many hoped and predicted. Why not, and what does this say about who mobile money is for, what it does, and how we might judge its success?

A Brief History of Microcredit

Since Grameen Bank launched the microcredit movement in 1982, the quest for financial inclusion of the world's poorest people has gained currency. Despite a few scandals, such as the oversupply of credit in places such as Andhra Pradesh, coalitions of development agencies, philanthropic organizations, and companies have continued to funnel money into microfinance, essentially banking upon microfinance as a powerful tool for socioeconomic development as well as a means for companies to make a profit. Mobile money, while not technically microfinance, has joined the ranks of financial 'products for the poor' aimed at increasing financial inclusion.

Small-scale financial products might seem to be merely the newest trend in poverty alleviation, but it actually has a far longer history than the standard microcredit story reveals. According to David Roodman,¹ one of the earliest recorded examples of people engaging in charitable lending is Jonathan Swift, author of *Gulliver's Travels*. In the 1720s, Swift would lend Dubliners five or ten pounds without interest, so long as they could find two co-signers to guarantee the loan. Over the next couple of decades, charitable loan associations began appearing in Dublin and spread slowly throughout Europe.

The inclusive finance movement that has emerged over the past few decades resembles these early organizations in its aims and practices. However, there is one major difference. Finance today is far more globally integrated than it was in the 17th century. When a person signs up for a loan, a bank account, or a mobile money service, they are joining a vast, interwoven financial system. Unlike non-fiat currencies such as Bitcoin, which aim to provide an alternative to the world monetary system, inclusive finance has no such goal.

Mobile money does provide alternatives, but of a different kind. Rather than allowing users to opt out of formal systems, mobile money offers an alternative to informal financial services, which can be slow, inefficient, and expensive; and to formal financial services such as remittances, which often charge prices that the world's poorest people cannot afford. From a microeconomic perspective, mobile money offers significant benefits to individuals, households, and small to medium enterprises (SMEs). They can make life far easier for individual users, saving time and money, such as by allowing people to make instant transactions via their mobile phones rather than traveling large distances at great cost to deliver money. Mobile money transactions can build busi-

1. David Roodman, *Due Diligence: An Impertinent Inquiry Into Microfinance*, Washington: CGD Books, 2012.

nesses and save lives by speeding up the flow of cash and improving its management. It can prevent robbery, as it is more difficult to steal money that is stored electronically than in cash form. It can also prevent the loss or damage of money through poor storage conditions. Moreover, mobile money represents an increase in consumer choice. The pricing and characteristics of mobile money products are normally sufficiently different from other financial products that they truly offer customers something new. And mobile money is often far more affordable than similar products.

Both Bitcoin and mobile money aim to place greater power and choice in the hands of their users, but through completely different means. Mobile money is built upon the assumption that the global financial system is better placed to offer alternatives and choice than a decentralized system. How can we assess the contribution of mobile money to the welfare of its users?

Mobile Money as Finance

In M-Pesa's 'Send Money Home' advertisement,² a city worker glances fondly at a photograph on his desk. He picks up his phone and chooses the 'send money' option. As if by magic, bills fly from his phone and through the air. The camera cuts to a scene of a rural field, where an elderly couple are working in their garden. The woman gets out her phone, and money descends from the sky. She shows her new balance to her husband and heads to an M-Pesa agent to extract cash.

While a fiction invented by Safaricom, this advertisement is indicative of mobile money's global image. It is widely seen as a product for individuals in developing countries who have limited access to formal financial tools, yet who have a need for cheaper, more reliable services, especially remittances. And, indeed, mobile money has reached millions of users of this kind. But remittances are not all there is to mobile money, nor are individuals in developing countries the only kinds of users. While mobile money provides a convenient and effective means of distributing microfinance products, it is far broader, and more global, than its image suggests.

First, the products offered by many mobile money providers could be considered to be ordinary finance, rather than microfinance. In Kenya and other countries, mobile money products have extended beyond simple remittances and savings to include interest-bearing accounts, insurance, and loans. These typically involve small amounts of money and are available to people with low incomes, which is why they sometimes attract the label 'microfinance'. And yet, what is the aim of microfinance programs if not to incorporate its customers into the mainstream economy and financial system? Recipients of microfinance loans, for example, are encouraged to 'graduate' to bank accounts, debit and credit cards, and larger loans.³ Furthermore, the term 'microfinance' itself is misleading, conjuring images of small programs in small communities. In actuality, microfinance is big business.

2. See <https://www.youtube.com/watch?v=nEZ30K5dBWU>.

3. For example, BRAC developed their 'graduation model' to 'graduate the poorest from ultra-poverty', <http://www.brac.net/content/end-sight-ultra-poverty-scaling-bracs-graduation-model-poorest>. Fonkoze in Haiti bases their Chemen Lavi Miyò program on this model, <http://www.fonkoze.org/what-we-do/step-1-clm/>.

Second, mobile money articulates with movements in money across international borders. Over the past few decades, remittances have come to be an increasingly significant proportion of global cash flows. Worldwide, it is estimated that around \$414 billion was sent in 2013,⁴ with a typical individual remittance totalling \$100-\$300.⁵ Until recently, mobile money services were generally confined within national borders due to technical and regulatory restrictions, but they are increasingly being used for international transfers. Since 2011, a partnership between Safaricom and Western Union permits international transfers from 43 countries to M-Pesa accounts.⁶ Safaricom plans to launch a cross-border service between M-Pesa customers in 2015, pending regulatory approval. In 2014, Orange launched a transfer service allowing its customers to send money between Mali, Senegal, and Cote d'Ivoire, and in 2014, Tigo enabled a wallet-to-wallet service between Rwanda and Tanzania.⁷ Furthermore, researchers have long noted that remittances are often sent to a representative family member, who then redistributes the money among family members domestically. Mobile money provides a faster, more reliable mechanism for this redistribution. Given the size of the global remittance market, and the rapid proliferation of mobile money services globally, it appears highly likely that we have not seen the last of cross-border mobile money services.

Third, mobile money's customer base is far broader than M-Pesa's advertisement suggests. Unlike with microfinance programs, mobile money services do not uniquely target poor users. While mobile money services are particularly amenable to people who have low incomes and no bank accounts, they are available to everyone. In fact, there is some evidence that early adopters in Kenya and Tanzania were generally people who already had bank accounts.⁸ In Haiti, InterMedia found that early adopters tended to be relatively affluent.⁹ As time goes on, ratios can shift. Suri and Jack found that, outside Nairobi 'the share of the unbanked who used M-Pesa rose from about 21 percent in 2008 to 75 percent in 2011'.¹⁰ Nevertheless, people who are relatively affluent continue to make up a significant portion of mobile money users.

Furthermore, it is incorrect to assume that all mobile money customers are individuals. Businesses, NGOs, and government bodies use mobile money to make and receive payments. In fact, organizations using mobile money to make mass transactions are crucial for mobile money services to make traction in the early days of deployments. In Afghanistan, USAID worked with the government to implement the payment of police

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4. World Bank, <http://www.worldbank.org/en/news/feature/2013/10/02/Migrants-from-developing-countries-to-send-home-414-billion-in-earnings-in-2013>.
 5. IFAD, <http://www.ifad.org/remittances/maps/>.
 6. Kusimba, 'Mobile Kin and Mobile Money: The Anthropology of International Remittances in Kenya', IMTFI Working Paper, 2013.
 7. Discussed by the GSMA, <http://www.gsma.com/mobilefordevelopment/the-rise-of-mobile-wallet-to-wallet-cross-border-remittance-services-whats-the-opportunity>.
 8. Gunnar Camner, Caroline Pulner, and Emil Sjöblom, *What Makes a Successful Mobile Money Implementation? Learnings from M-Pesa in Kenya and Tanzania*, GSMA, 2012.
 9. InterMedia, 'Mobile Money in Haiti: A Baseline Analysis of Access, Use and Barriers to Adoption', <http://audiencescapes.org/country-profiles/haiti/mobile-money-haiti-baseline-analysis-Gates-adoption-financial-services-HMMI>.
 10. Tavneet Suri and Billy Jack, 'Reaching the Poor: Mobile Banking and Financial Inclusion', *Slate*, 27 February 2012, http://www.slate.com/blogs/future_tense/2012/02/27/m_pesa_ict4d_and_mobile_banking_for_the_poor.html.

salaries via mobile money.¹¹ Globally, USAID has encouraged NGOs to incorporate mobile money components into their programs.¹² There is also a push to develop merchant payments, as has been done with branchless banking in Brazil, to encourage wider use of mobile money.¹³ Indeed, the success of mobile money depends upon its integration, not just laterally among individuals in a society, but along economic value chains.¹⁴ Mobile money depends upon many small transactions in order to be profitable, and for this, it must achieve scale at least at the national level, and preferably internationally.

Finally, mobile money providers are generally large banks and telecommunications companies. They are often multinational. For example, Safaricom is 40 percent owned by Vodafone, and since M-Pesa was launched in Kenya in 2007 it has expanded to Tanzania, Afghanistan, South Africa, India, and Eastern Europe. Telecommunications heavyweight Digicel operate in 31 markets throughout the Caribbean, Oceania and Central America, and operate mobile money services in Haiti, Fiji, Samoa, Vanuatu, and Tonga.

All these factors belie mobile money's image as a 'product for the poor'. Rural peasants certainly use, and benefit from, mobile money services, but in order to assess the global phenomenon of mobile money we need to be aware that a diverse array of stakeholders are driving its supply and demand.

The Demand for Mobile Money in Haiti

If there was ever a country that appears to need new financial tools, then Haiti is it. Banking infrastructure is scarce, and approximately 66 percent of bank branches are located in Port-au-Prince.¹⁵ Accessing bank branches can be difficult, and using them can be time consuming. Besides being badly distributed, bank branches are inefficient. Lines are long, with people often waiting hours to make a transaction.¹⁶ Microcredit institutions such as Fonkoze cover a larger portion of the country, and formal remittance services such as Western Union and Caribe Express are also better distributed. But remittance services such as Western Union can be very expensive to use, especially when people wish to spend small amounts of cash.

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11. This had two major advantages: it immediately added thousands of users to Vodafone's mobile money network, and it solved a serious corruption problem. People in the industry report that, when police officers received their salaries via mobile money for the first time, many were calling Vodafone to thank them for their pay rise. It turns out that their superiors had been skimming their salaries by as much as 20 percent. With mobile money, this was no longer possible. See <http://www.bloomberg.com/news/2011-04-13/afghan-police-now-paid-by-phone-to-cut-graft-in-anti-taliban-war.html>.
 12. '10 Ways to Accelerate Mobile Money: USAID-Citi Mobile Money Accelerator Alliance, Citibank / USAID', 2012, http://www.citibank.com/transactionservices/home/public_sector/docs/Mobile_Money_Article.pdf.
 13. See, for example, CGAP's various blogs about merchant payments, including branchless banking in Brazil, <http://www.cgap.org/blog/branchless-banking-brazil-making-it-work-small-merchants>.
 14. Espelencia Baptiste, Heather A. Horst, and Erin B. Taylor, *Haitian Monetary Ecologies and Repertoires: A Qualitative Snapshot of Money Transfer and Savings*, University of California Irvine: IMTFI, 2010.
 15. This estimate is given by Fonkoze on their website, <http://www.fonkoze.org/why-it-matters/key-statistics/>.
 16. See Baptiste, Horst and Taylor 2010; Taylor and Horst 2014.

This leaves a gap in the market for transfers and merchant payments that have generally been filled by informal services. Mobile money is an attempt to bridge this gap. It is a way for people without bank accounts or internet to access basic banking facilities through their mobile phone. They can deposit money, store it on their SIM cards, pay for airtime, and transfer money to other people. Unlike its banking system, Haiti's mobile telecommunications infrastructure is well developed, and mobile penetration is growing rapidly. Mobile money enables a wide distribution of service points, flexibility in how it is used by customers, and operates with pre-existing technology. This means that the service has the capacity to expand far more rapidly than banks, which depend upon cumbersome infrastructure.

In the six months leading up to the launch of mobile money in Haiti, our team conducted research in three sites to get a sense of the need and desire for mobile money among individual Haitians. Generally speaking we found that people were enthusiastic about the idea of using their phones to make transactions. Our interviewees particularly cited the time and cost of sending money and security issues concerning carrying money as reasons why mobile money might be preferable. In Haiti it is a common and low-cost way to send money around the country via public transport. They either travel themselves, send the money to a friend or relative who is traveling, or entrust the cash to a truck driver or boat captain. In one remittance route that we identified in the south of Haiti, boats travel along this route twice a week on market days, carrying goods, passengers, and money from the Dominican border to the town of Marigot. The boat journey takes around seven hours. Security is also an issue, as people carrying cash run the risk of being robbed.

In November 2010, two telecommunications providers launched mobile money: Digicel with TchoTcho Mobil and Voilá with T-Cash. We returned to the field to observe how Haitians were adopting the new service. After mobile money was launched, thousands of Haitians registered, responding to Digicel's and Voilá's advertising. Interestingly, Digicel's first television advertisement was similar to Kenya's, but a follow-up focused on issues of security. It showed an elderly woman extracting money from hiding places around her house and depositing it in her mobile money to keep it safe from her thieving nephew. By the end of 2011, over 800,000 Haitians had signed up for mobile money services; of these, between 6,000-9,000 were in development programs at any given time.¹⁷ While these numbers represent significant progress, they were lower than expected. Maarten Boute, the former CEO of Digicel Haiti, commented 'our main lesson learned is how difficult it is to educate customers. When we launched the service we assumed it would be something like selling a mobile phone, where you stick a mobile phone into someone's hand and almost anyone can start using it quite quickly because it's very easy to understand. With a mobile banking service or a mobile money service it's not quite that easy.'¹⁸ Hence demand for mobile money may be tempered by unfamiliarity with the technology. In the following section I discuss how barriers to uptake affect mobile money's supply.

17. Personal communication from Greta Greathouse, Chief of Party of HIFIVE, 15 February 2012.

18. Tate Watkins, 'Overselling Mobile Money in Haiti', *Haiti Rewired*, 11 June 2012, http://haitirewired.wired.com/profiles/blog/show?id=4920407%3ABlogPost%3A77664&commentId=4920407%3AComment%3A78008&xg_source=activity.

The Supply of Mobile Money in Haiti

Mobile money is ostensibly a market-driven product that is developed and offered by private companies whose goal is to turn a profit. Often these are telecommunications companies that partner with banks. In Kenya, Safaricom has been very successful in scaling mobile money, and in the past year or so has launched an array of products that work on the mobile money platform, including insurance.¹⁹ However, mobile money exhibits various factors that mean that a purely market-based solution is not always viable. As Maarten Boute described for Haiti, customers may be reluctant to adopt new technology and new ways of using money. Moreover, mobile money globally is plagued by a 'scaling' problem whereby people will not sign up for mobile money if there are not enough agents in convenient locations, and businesses will not sign up to be agents unless they feel that they have a strong customer base.²⁰ Hence, while mobile money is a commercial service, non-profit players have been central to its development and uptake. In fact, one could argue that without non-profit interest, mobile money may not have come to exist in Haiti at all.

On 10 June, 2010, six months after the earthquake that levelled Port-au-Prince and its surrounding areas, the Bill and Melinda Gates Foundation and the USAID-funded Haiti Integrated Finance for Value Chains and Enterprises (HIFIVE) announced the launch of the Haiti Mobile Money Initiative (HMMI) to stimulate the development of mobile banking services in Haiti.²¹ The HMMI offered \$10 million in prizes and \$5 million in technical assistance for companies to develop and expand mobile banking services across the country. In October 2010, D, pocketing \$2.5 million. In August 2011, Voilá won the Second to Market Prize of \$1.5 million.²² Voilá were bought out by Digicel in 2012, but mobile money survived. At the time of writing, TchoTcho Digicel claims to have 420 active agents distributed around Haiti.²³ USAID continue to drive demand by requiring NGOs in Haiti to include a mobile money component into their socioeconomic development programs, fostering links between market and welfare.

It is not difficult to see why companies might welcome NGO involvement in mobile money. For a mobile network operator (MNO) that introduces a mobile money service, the cost of educating customers about the new service would likely be prohibitive. But when an organization such as Mercy Corps or the Haitian government pays people through mobile money, the MNO does not have to wear the costs. Furthermore, people are incentivized to use mobile money. In the first few months, however, there were no mobile money agents outside of Port-au-Prince, and so most active users were connected to NGO programs. Most had been required to register for mobile money in order to receive aid, often receiving a free phone or SIM card in the process. From its launched in late 2010, Mercy Corps and World Vision used mobile

19. See <http://www.cgap.org/blog/m-insurance-ensuring-take-while-doing-no-harm>.

20. Ignacio Mas and Dan Radcliffe, 'Scaling Mobile Money', Bill & Melinda Gates Foundation, 2010, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1681245.

21. Haiti Mobile Money Initiative/HIFIVE, 'Awards Grant to Mercy Corps to expand Mobile Money Services in Rural Areas', Press release, 27 October 2010, http://www.microlinks.org/ev_en.php?ID=46502_201&ID2=DO_TOPIC.

22. See <http://kdid.org/projects/field-support/hifive/hmmi>.

23. See http://www.digicelhaiti.com/assets/uploads/Active_Agent_List.pdf.

money to deliver conditional cash grants and cash-for-work payments.²⁴ A range of other organizations have since started developing mobile money, including UNDP, CARE and the World Food Program.²⁵ Government-to-person (G2P) payments are also taking place. In 2012, the Haitian government launched a program called Ti Manman Cheri to pay grants to mothers for keeping their children in school.²⁶

Mobile money thereby blurs the line between commerce and development. Indeed, this is reflective of a trend over the last two decades towards multilateral partnerships such as USAID's Global Development Alliance (launched in 2001). These partnerships move away from a post-World War II development model focusing on direct aid to states or purely non-profit community projects, instead promoting cooperation between government, NGOs, and capital investment. The rationale behind this shift rests upon the belief that businesses can often serve poor people better than non-profits because they are more efficient and have more incentive to innovate.

This idea has particularly taken hold in the global south, where governments and scholars express frustration with the slow progress made in raising the living standards of the world's poorest people, despite the influx of billions of dollars in development aid. Influential works such as C.K. Prahalad's *The Fortune at the Bottom of the Pyramid* (2009),²⁷ Benioff and Southwick's *Compassionate Capitalism* (2004),²⁸ and Hammond's *The Next Four Billion* (2007)²⁹ make a business case for the ways in which corporations can profit to the benefit of the world's poorest people. In these accounts, providing products of the poor attacks the bases of poverty by including people in the market who were previously ignored in marketing strategies. The shift from a USA-ROW (Rest of the World) dichotomy to the inclusion of the emerging middle class and youth markets in the BRICS (Brazil, Russia, India, China, and South Africa) countries is indicative of the increasingly popular view that consumption and choice – what is sometimes characterised as 'consumer citizenship' – not only provides new means to achieve different ends, but may also empower people to take control over their own lives and pull themselves out of poverty.

One of the most interesting characteristics of this shift is that it moves in two directions. Under multilateral partnerships for development, welfare is being outsourced to companies, but this is not the end of the story. The opposite is also occurring: com-

24. 'Mobile wallets help Haitians rebuild', *Mercy Corps*, 3 August 2011, <http://www.mercycorps.org/articles/haiti/mobile-wallets-help-haitians-rebuild>; see USAID for World Vision's involvement, <http://www.usaid.gov/news-information/fact-sheets/haiti-mobile-money-initiative>.

25. Bill & Melinda Gates Foundation/Dalberg, 'Haiti Mobile Money: A Point-In-Time Case Study', <http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/05/Haiti-Mobile-Money.pdf>.

26. 'Helping Ti Manman Cheri in Haiti: Offering Mobile Money-Based Government-to-Person Payments in Haiti', *Bankable Frontier Associates for CGAP*, July 2013, http://www.cgap.org/sites/default/files/eg2p_Haiti.pdf.

27. C.K. Prahalad, *The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits*, Revised and Updated 5th Anniversary Edition, Upper Saddle River, NJ: FT Press, 2009.

28. Marc Benioff and Karen Southwick, *Compassionate Capitalism: How Corporations Can Make Doing Good an Integral Part of Doing Well*, Pompton Plains, NJ: Career Press, 2004.

29. Allen Hammond, *The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid*, Washington D.C.: The World Resources Institute, 2007.

panies outsourcing aspects of consumer welfare to non-profits.³⁰ For example, when Mercy Corps ran a conditional cash grant program in Saint Marc, Haiti, they gave away free mobile phones (supplied at reduced cost by Voilá) and taught customers how to set up and use mobile money. Mercy Corps were then able to transfer the conditional cash grants to their beneficiaries' T-Cash (mobile money) accounts. As a result, Mercy Corps was able to both educate people in a new service and avoid certain costs and difficulties involved in handing out cash or buying expensive, fraud-proof certificates that their beneficiaries could redeem in retail stores. Voilá, in turn, gained new customers for its network and its mobile money service.

But what of the customers? It is worth noting that, in the case of Mercy Corps's cash grants and similar development programs, beneficiaries received a clear benefit (cash or goods), but they did not have a choice as to how they would receive their money.³¹ Hence one of the primary purported benefits of market provision – consumer choice – is in this case eroded by the reconfiguration of supply to encourage demand. Somewhat ironically, while critics of the 'products for the poor' model critique the idea that free markets can be harnessed to increase consumer welfare and reduce the suffering that characterizes poverty, it turns out that the market is not free at all.³²

An Alternative, Inclusive Success Story?

The blurring of boundaries between private and public interests in mobile money's supply and demand suggest that, when objectified in certain products, socioeconomic development and commerce lose their distinction. Should we be worried that it is increasingly difficult to tell profit motives apart from social ones? Are 'social goods' really 'social bads'?

Like other microfinance products, mobile money has many social applications, but it also comes with risks. Assessing these risks is only possible if we have a clear view of what mobile money is, how it is delivered, who is using it, and who is driving its uptake. When we tease apart the mobile money supply chain, it becomes clear that the stereotypical mobile money user can be rather different to the one depicted in commercial advertisements. It also becomes evident that the suppliers of mobile money are not just companies.

From a political economy perspective, one could argue that it is high time that this financial inclusion – of the mobile money variety – occurred. In his book *The Ascent of Money*, Niall Ferguson argues that the development of financial products was a crucial component of the industrial revolution.³³ Among other things, financial services

30. It is worth noting that the blurring of the line between commerce and development goes both ways. Digicel have a great deal of experience in building social concerns into their products. When Digicel arrived in Jamaica in 2001, they cornered the market with inexpensive handsets and calls, making them affordable for the first time to millions. Their handsets incorporated features that were designed especially for people with little money, such as their 'call me' service. See Heather Horst and Daniel Miller. *The Cell Phone: An Anthropology of Communication*, Chicago: Berg Publishers, 2006.

31. Privacy is also a growing issue, especially in cases where people must supply biometric information to register for financial products.

32. Anke Schwittay, 'The Marketization of Poverty', *Current Anthropology* 52.3 (2011): 71-82.

33. Niall Ferguson, *The Ascent of Money: A Financial History of the World*, New York: Penguin, 2008.

facilitated the direction of capital to where it was needed. Countries that innovated financially, such as the Netherlands, got ahead of the curve in the global economy. Most of them are still strong today. In contrast, countries that did not develop financial tools and systems, focusing instead on traditional economic production, were left behind. Financial tools assisted economic development through capitalization. Moreover, finance itself became a major industry that is concentrated in a handful of global cities, with a relatively small number of people controlling the majority of capital. Today, the United Kingdom is the largest exporter of financial services in the world, while the United States and the majority of small countries are net importers of financial services.

New financial products and services, such as smart cards and mobile money, are unlikely to present a direct challenge to the global distribution of wealth. First, organizations such as the GSMA contend that mobile money services can contribute to economic growth, but to date there appears to be no clear evidence of this. Indeed, there is no clear evidence that microfinance contributes to economic growth after four years of its existence.³⁴ Of course, one could argue that it is not mobile money alone that is intended to drive economic growth; rather, it is infrastructure that forms part of a process of development. This works much in the same way that a highway does not have transformatory power by itself, but its effects are realized when it is coupled with port facilities, schools, hospitals, banks, and regulation reform. Hence, while it is difficult to measure the contribution of mobile money to development, we should not be too hasty to rule it out as a contributing factor.

Second, many mobile money services are run by companies that are at least partially owned by foreign interests. For example, Vodafone U.K. has a 40 percent stake in M-Pesa, arguably the most successful mobile money service in the world with over 17 million subscribers. Digicel TchoTcho in Haiti is a private company owned by Dennis O' Brian and headquartered in Kingston, Jamaica. The current trajectory of the global mobile money market suggests, then, that it is unlikely to change the position of poor countries as net importers of financial services.

Other challenges also need to be acknowledged. As we have seen with the 2008 global financial crisis, problems in the system can have wide-reaching effects. As I have noted, mobile money and microfinance are envisaged as initial steps to introduce customers to the formal banking system. This increases the capacity of consumers to access much-needed financial products, such as loans and insurance, but it also exposes them to risk. The common wisdom that one should not put all of one's financial eggs in the same basket seems increasingly difficult to achieve when our financial systems are becoming so integrated that it is impossible to predict where risk will come from, and to where it will ultimately flow. The idea behind inclusive finance is to move capital to the people who need it most, yet financial products tend to facilitate the flow of capital from periphery to core.³⁵

34. David Roodman, *Due Diligence*.

35. Daniel Verdier, *Moving Money: Banking and Finance in the Industrialized World*, Cambridge: Cambridge University Press, 2002.

What does this mean for mobile money? First and foremost, mobile money is not just microfinance, it's also finance – and on a global scale. Mobile money collapses a wide range of interests into one platform, and how we assess it depends upon where we are standing. From the perspective of a Haitian trader, mobile money could be a very welcome alternative to sending money via boat. For an NGO, paying a conditional cash grant via mobile phone may be far easier, and safer, than paying cash. But one thing is certainly clear: neither mobile money, nor other initiatives in financial products in Haiti, presents an alternative to the formal financial system. Rather, they integrate people squarely into financial globalization.

This point matters irrespective of whether you believe financial globalization is a good idea or not. Any financial product can be problematic when rolled out without thorough consideration of its intrinsic characteristics and the context in which it is being delivered. The microcredit movement has benefited many people around the world, but the oversupply of credit has also caused a great deal of harm. Mobile money, which has the potential to reach far more people and deliver the entire suite of microfinance products, also merits scrutiny. Both the micro context of the stereotypical user, and the macro context of finance, will influence if, where, and when mobile money can meet the 'double bottom line' of turning a profit and achieving social goals.

This means being realistic about whom mobile money is for. I don't agree with my colleague in the audience that mobile money can be called a 'failure' in any sense. The fact that uptake has not met over-hyped expectations should not be surprising or particularly concerning. Is mobile money successful in the eyes of development organizations and their workers? Perhaps not yet, but they are working as hard as they can to push its reach. Is mobile money viewed as successful by the companies who provide the service? If they continue to offer it, then we must assume that it is.

Is mobile money successful in meeting consumer needs? This latter question is more difficult to answer, because people use mobile money in different ways. I feel that the answer to this question depends upon whether people have a choice to use it or not. People should not be coerced into using it, but as Maarten Boute points out, nor can they choose to adopt it if they don't know what it is. And yet, even in situations where people are informed and mobile money is a realistic option, it needs monitoring. More of a platform than a product,³⁶ mobile money can easily be harnessed for ends that are truly useful to customers and an alternative to other, more costly financial tools. But the possibilities for mobile money to facilitate predatory lending and fraud are also real.

All of these issues – good and bad – can be far more readily identified if we change the way we ask questions about mobile money. Both the hype and the scepticism need to give way to a more balanced approach to mobile money that considers what socio-economic value it provides, to whom that value accrues, and what the consequences of different uses and ways of providing it might be.

36. Jack Kendall, et al. 'An Emerging Platform: From Money Transfer System to Mobile Money Ecosystem', *Innovations* 6.4 (2012): 49-64.

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**‘LIVE AS FRIENDS
AND COUNT
AS ENEMIES’:
ON DIGITAL
CASH AND
THE MEDIA OF
PAYMENT**

**EDUARD DE JONG,
NATHANIEL TKACZ,
AND PABLO VELASCO**

‘LIVE AS FRIENDS AND COUNT AS ENEMIES’: ON DIGITAL CASH AND THE MEDIA OF PAYMENT

**EDUARD DE JONG,
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Currency experiments are enjoying something of a renaissance. Some have the number of digital currencies as high as 143, most of which have emerged over the last five years. How did we get here? These experiments have been praised and rallied around by dedicated followers. For some, dedication approaches religious fervor. Critique has also been quick to the scene: constructive critique by insiders or fence-sitters; critique from the outside; critique on the grounds of politics, of economics, ecology, or gender – the list is long and pointed.

The duration of these experiments is also roughly equivalent to the global economic downturn, which is to say that most people have had less money of the non-experimental kind. Money is perhaps the primary media of economic *crisis* in that it translates abstract global disasters into felt hardship, into lack. It is felt most as a medium of crisis when it is in retreat, when its function as a medium of exchange falters. The same cannot be said of technology over the same period. Personal computational devices are only getting ‘smarter’. Moore’s law rolls on. The Hacker Ego is at an all time high. Is this how we got here? Perhaps. But among this general backdrop is a more specific history, of digital cash and technologies of payment. It is a history of developing standards, of road toll systems, magnetic stripe (magstripe) cards and cards with processors (smart card), of radical prototyping and blue-sky experiments, of international cooperation, of banks mixing (or fighting) with telcos, of privacy and security, of failed experiments, of failures that were also successes. This is a history of those who ‘live as friends and count as enemies’.

These are Eduard de Jong’s words, and his personal history is woven through that of digital payment. In June 2014 de Jong visited Nathaniel Tkacz in the English Midlands and over a series of interviews at The University of Warwick, he mapped out some of this largely untold history. Pablo Velasco Gonzalez sorted through the raw material and turned it into something coherent. The arrangement, style, and references are thanks to him. Below, the passages in bold are extracted directly from the interviews. All originate with de Jong and they function to punctuate the rest of the material. The text surrounding the extracted material is collaboratively written, at times summarizing and others elaborating the interview material. Like the history of digital cash itself, de Jong’s story begins with David Chaum’s enterprise, DigiCash.

In 1990, Chaum was already a renowned cryptographer working at the University of Amsterdam's Center for Mathematics and Informatics (CMI). At the time, the Minister of Transport in the Netherlands was considering the introduction of road pricing: the automatic collection of a toll for the use of the motorway system. Chaum took this as an opportunity to implement his ideas for electronic money and start a business. His goal was to provide a working prototype of a payment system that was capable of making complete transactions at speeds of up to 80 km/h, and which were *secure* and protected the *privacy* of the payer. Chaum gathered a group of skilled engineers, mostly from his Eindhoven University former contacts,¹ and started building his e-Cash system with a smart card to hold the funds. De Jong was hired to document the implementation of this system. Specifically, he came up with a formal method to describe the implementation of the e-Cash algorithms, which acted as a bridge of sorts between the algorithms and the assembly language implemented in a smart card. In less than three months, a prototype was ready that included a smart card, a card terminal for use in a car, and a central system unit dubbed the 'bank'.

'This was really the first fully electronic payment system ever. There was a body of knowledge; the 80s had seen a lot of progress, a lot of theories and analyses about how to implement cryptographic algorithms for electronic money efficiently and securely. So the theoretical basis was there, but it was the first time it all came together into building something that could work.'

The smart card was first of all a store of value. The stored value was securely transferred with a cryptographic key and algorithm also stored in the card. It was in the tradition of prepaid phone and credit cards, but focused much more on security and privacy. To protect privacy in public key cryptography Chaum had invented 'blind signatures' in the early 80s.² A first draft of his currency system – without any attempt at implementation – was also already published in 1982, when he was still a Professor at UCLA.³ The blind public key signature that protected the transfer of e-Cash money was cleverly mixed with the Data Encryption Standard (DES – which was developed at IBM by Mathias and Meyer and based on the work of Horst Feistel). For an e-Cash transfer to occur a cryptogram based on a pre-generated digital signature was inscribed with the value to transfer and the smart card software subtracted the value from its stored 'spendable money' before sending out the cryptogram. One would spend one signature to encode a quantity of money and the card stored about 20 or 30 usable payment signatures, cleverly wrapped into a small number of blind signatures (and loading money in the card also loaded new signatures). For security purposes each payment signature could only be used once. E-Cash mimicked the qualities of traditional cash: transfers were immediate and one could not spend more than one had. Another unique characteristic of the first e-Cash implementation was that it used a 'cold processor' protocol: the terminal receiving the money guided the card through all the needed steps to do the cryptography. This protocol enabled e-Cash to overcome the processing limitations in the smart

1. 'How DigiCash Blew Everything', January 1999, <http://cryptome.org/jya/digicrash.htm>.

2. David Chaum, 'Blind Signatures for Untraceable Payments', in David Chaum, Ronald L. Rivest, and Alan T. Sherman (eds) *Advances in Cryptology*, New York: Springer, 1983, pp. 199-203.

3. Andy Greenberg, *This Machine Kills Secrets: How WikiLeaks, Hacktivists, and Cypherpunks Are Freeing the World's Information*, New York: Random House, 2012.

card for the use of public key cryptography. From a purely technological perspective, e-Cash was a success. However, the first prototype to be used in cars was never tested on the road.

‘Politics in the Netherlands changed and there was no longer support for a toll road payment system. E-Cash was ready, but it was no longer relevant.’

The DigiCash team had fulfilled its first goal of making a working prototype for the national road-pricing scheme, ready to be converted by manufacturers into the roadside and in-car equipment. But Chaum was more of a cryptographer than a technology marketer. He failed to recognize the complexity involved in creating a market for this new technology. He underestimated the *nontechnical effort* involved in turning the prototype into a product. DigiCash struggled along without a successful implementation of its prototype. Two years later it realized a second prototype of e-Cash, this time for general payment and with a bank as lead customer, but with a similar result. De Jong learned from these early experiences, and years later, the market failure of e-Cash shaped his thinking about how to approach the market after the development of Java Card technology, which is based on his patents. For Java Card the initial marketing cost were five times the development costs.

‘DigiCash was not looking at the market. All the focus was on the prototype. Where DigiCash completely failed was in realizing how much work it would be to get a foothold in the market with what they had. Instead, they were spending their money on even more advanced technologies. They completely lost the link with reality, of how to market a technology so advanced, and how to get people to buy into it. DigiCash was certainly way more advanced than any solution that society was willing to accept at the time. It’s probably fair to say that it was *too early* in its insistence and successful implementation of *absolute security*.’

In 1992, de Jong left DigiCash and together with another former DigiCash employee, he started a consultation company on smart cards and cryptographic techniques. By September 1998, after failing to attract more than a handful of strategic partners, DigiCash had declared bankruptcy. Attempts to keep its technology together failed, and one company took up the smart card operating system, while the Intellectual Property portfolio was sold to a Canadian company. Its communication technology, in a simpler and less secure way, was deployed in other kind of ledger-oriented enterprises, such as E-tag in Australia.

Fifteen years earlier banks had started to look at smart cards as the next technological step in the use of payment cards. Credit cards, and in Europe also debit cards, equipped with magstripe and complemented by data communication to back office computers with an account database, were the majority of electronic payments at that the time. They invested manpower in international standardization of this emerging technology, both in Europe within CEN (Centre European des Normes) and in ISO, where the standards for the embossed credit card and the magstripe card had already been developed. However, the banks were not interested in cash; that is, in digital cash systems as the opposite of their traditional ledger systems – at least not as a priority. If anything, the emergence of the first electronic cash systems, systems without the need for a ledger, was met with some trepidation by the banks. They were concerned about

their role in payments being reduced. Such fears were not completely without ground, as a number of large European telecom operators were looking at new opportunities to use their experiences with successfully replacing physical cash in payphones. Expanding to other small payments, newspapers, snacks, vending machines and so on, looked like good business opportunities for these telcos. As we will see below, some banks took up the challenge and got involved in experiments with electronic-cash smart cards.

After DigiCash was established, the next attempt to realize electronic cash was Danmønt, in 1991. It was a smart card with a disposable 'electronic purse' for small payments, developed by a subsidiary of PBS (Danmønt S/A) and endorsed by KTAS, the Copenhagen Telephone Company, and HT (Capital Traffic, a transport institution). Its pilot started in 1992 and it was introduced on a nation-wide scale in 1993, mostly as a payment method for launderettes and telephone booths.⁴ With Danmønt, the payer smart card sent a message with value to a merchant smart card that was authenticated by a secret key using the DES algorithm. Keys were stored in the smart cards, as was the amount of money to spend or receive, respectively.

A year later, Mondex followed. Initiated by the cryptographer David Everett, who worked at NatWest bank at the time, Mondex, like e-Cash and Danmønt, used an exchange of messages to transfer a value. The Mondex team started building a system with technology that had already been patented in 1990 by Tim Jones and Graham Higgins, who refer in their patent application to Chaum's ideas. In the Mondex scheme a secure computer acted as 'originator', one per country, to create units of electronic cash, which were then sold for traditional currency to 'issuers' (banks) that could sell them – again, in exchange for traditional currency – to final Mondex users. A transaction between two users was validated by secret keys and algorithms stored on the smart cards held by each user. Electronic money received by an end user could only be exchanged back to legal tender by transferring it back to an issuer. The Mondex originator, its issuers and end users all used the same basic security protocol to transfer value, with the issuers expected to deploy racks filled with smart cards. According to de Jong, the fully off-line security provided a potential fatal security weakness. Mondex was put to a consumer test in July 1995 in Swindon, U.K., McDonald's, BP, Sainsbury's, and other major retailers were involved in the test.⁵ NatWest and Midland Bank (now part of HSBC) were shareholders of Mondex. The Bank of Scotland was also a sub-franchise holder, and both the Royal Bank of Canada and the Canadian Imperial Bank had planned a pilot program for it in 1996.⁶ The system was eventually sold to Mastercard, which kept it alive for the smart card operating system, Multos,⁷ which was developed to support the electronic money system. Mondex's security protocol

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4. Knud Böhle, Michael Rader, and Ulrich Riehm, 'Electronic Payment Systems in European Countries: Country Synthesis Report', Forschungszentrum Karlsruhe, September 1999, <http://www.itas.kit.edu/pub/v/1999/boua99b.pdf>.
 5. E.K. Clemons, D.C. Croson, and B.W. Weber, 'Reengineering Money: The Mondex Stored Value Card and Beyond', in *Proceedings of the Twenty-Ninth Hawaii International Conference on System Sciences* 1996, Vol. 4, (1996): 254-61, doi:10.1109/HICSS.1996.495345.
 6. Clemons, Croson, and Weber, 'Reengineering Money'.
 7. Peter Landrock, 'Mondex', in Henk C.A. van Tilborg (ed.) *Encyclopedia of Cryptography and Security*, Berlin and Heidelberg: Springer, 2005, p. 394, http://link.springer.com/referenceworkentry/10.1007/0-387-23483-7_262.

has not been published⁸ and consisted of public key signatures to validate messages with a public key from the Mondex originator protecting the authenticity and the privacy of the per card unique transfer key. In 1996, smart card chips could not yet perform public key cryptography efficiently and the Swindon trial for Mondex used a modified protocol using the DES algorithm and shared secret keys.

Smart cards had already been used as pre-paid phone cards from the mid-1970s. But consciousness of their much broader possible application, in medical records, banks transfers, driver's licenses, public transport, and electronic payments, for example, only emerged through the 1980s and 90s. The 1987 Smart Card 2000 conference co-organized by Chaum is testimony to this growing awareness. International standardization for smart cards started in 1984 as an extension to standardisation on credit cards, which had started in 1970. Advanced technology people from banks, researchers at telco-labs, and representatives of the fledgling smart card industry came together four or five times a year under the banner of ISO/IEC SC 17WG4 to discuss standards for physical design aspects, like the size and placement of the chip in the card, the size and shape of the chip contacts for communication with the processor, and for the basic operations to be supported, such as reading and writing to memory and doing cryptography. By 1989, work in 'WG4' on the first aspects of standardization resulted in three standard documents. Like all standardization work these documents reflected the 'give-and-take' negotiations of the participating companies. Consensus for the location of the contacts, for example, proved hard to achieve and the first standard allowed for two different places. One chip location, called, with some chuckles, the 'French position' specified in the first standard was phased out in later documents. Finally in 1995 a fourth standard was published: ISO/IEC 7816-4. For those involved, this result was celebrated by handing out T-shirts with the text: 'survivor of ISO/IEC 7816-4'. De Jong joined the ISO standardization group just before this milestone.

European countries had identified these cards as an area in need of European regulation and standardization beyond what was happening in the ISO group. In particular they were looking for standards for card applications. The European Standardization Body (CEN TC224) was set up to do this work in 1990. Within TC224 an Electronic Money Group (WG10) was established with someone sponsored by Danmønt as its first convenor, and included members from the Bank Union in Norway (Edmond Al-nianakian), Masterpay in Belgium (Phillipe Duhamel), the U.K.'s telecommunications, RATP (Régie Autonome des Transports Parisiens) (Phillipe Vapperau) also in France, and de Jong as the independent technology provider from DigiCash. He joined in 1991, while still at DigiCash, mostly to decide what should be added to the standard to ensure that it would be compatible with the more complex security protocols used by DigiCash. The collision between people from the electronic cash, banks, transport and payment industries, and across five countries, created difficulties in achieving a technical agreement or even an understanding of the standard. All the parties had different interests in the different aspects of the technology. Indeed, initially in WG10 there was no clear understanding of the nature of an electronic money system as something that

8. Gerhard Schellhorn et al., 'The Mondex Challenge: Machine Checked Proofs for an Electronic Purse', in Jayadev Misra, Tobias Nipkow, and Emil Sekerinski (ed.) *FM 2006: Formal Methods*, Lecture Notes in Computer Science 4085, Berlin and Heidelberg: Springer, 2006, pp. 16-31.

is actually different from traditional cash. This general understanding did emerge, but further difficulties arose with the specification of the actual protocols. De Jong recalls that the main discrepancies were on the structure of data stored in the smart cards and their security attributes. The Germans on the task force wanted something more structured than the other parties were willing to accept, and for a long time representatives from Mondex, who joined the group later, were unwilling to modify their message protocol to fit with the standard's idea for a unified set of messages.

'In standardization for IT, agreeing has come to mean: we agree to have a label for each other, for our technology, and you implement my technology using my label and I implement your technology using your label.'

More parties joined later, including Chris Stanford of the U.K.'s GEC Traffic Automation Company and Ram Banarjee, one of the founders of General Information Systems Ltd (GIS). Established in 1985 in Cambridge, GIS was an early Mondex supporter, designing and building 'wallets' to give a Mondex user an interface to review transactions in the card as well as the overall balance. Five years and 20 meetings after de Jong's inclusion in the electronic purse standardization group, the number of people had grown from 6 to 60 (in 1996). It was the peak time of the electronic cash systems' deployment.

'They all believed this was going to happen soon. I mean, DigiCash proved that there was a lot of interest. It had generated a lot of hype. They believed, if they could just all come together, get organized, get a standard and get the implementations deployed...'

The test in Swindon was happening at this time, both in banking and transport. Another bankcard was deployed in Germany (but with government specifications that demanded the strong involvement of a telco), and Carte Bancaire deployed a least one in France. In the Netherlands two cards were deployed, one supported by telcos and one by banks.

'We are in 1996. Everybody is ready to deploy and everybody deploys. And then, basically, nothing happens.'

Why? According to de Jong, the banks remained primarily interested in strengthening their existing cashless payment systems, the credit and debit card transactions at the point of sale. To that end, the three international payment associations that handle the majority of these transactions, Europay, Mastercard and Visa, got together to form yet another standardization organization (EMV). In other words, there were multiple energies going in different directions and multiple strategies being deployed or tested simultaneously. EMV developed a standard for actually using a smart card at the point of sale, to recognize the type of payment (credit, debit, electronic cash), and with user elements like entering a PIN. A smart card system for debit or credit cards was a migration from the familiar magstripe cards. Towards the end of the 90s these standards were all but ready, and once in place the banks became very focussed on actually introducing smart cards as payment cards. They wanted to reap the benefits of reduced card fraud that smart cards promised. That is, they were more interested in smart cards as a security technology and less interested in its capacity to facilitate digital cash transactions.

Getting 'PIN&Chip' (as the use of smart card in point-of-sale payments became known) introduced took a full decade. As a migration from magstripe cards, smart cards did not fundamentally alter the centralized model of banking. This banking model is known as a ledger system, where the actual transfer of value does not take place at the point of interaction between payer and payee but rather through the administrative action of an intermediary. The word 'ledger' comes from the large flat books that banks traditionally used to keep records of the financial transactions they performed for their customers.

With the introduction of smart cards for debit and credit payments well underway, two more payment networks, American Express and JCB (originally Japanese) join EMV. By that time – in the early 2000s – banks reduce their direct involvement in smart card standardization, and instead channel their influence through EMV and Global Platform – yet another smart card related standards organization. The banks' interest in digital cash had lost momentum, and had begun to look more like a defensive, knee-jerk reaction to Chaums' e-Cash implementation. Despite standardization agreements and 'technically' successful deployment in many countries in Europe, most electronic cash systems are not widely adopted by the public. As a result, the interest of operators, banks, and telcos wanes. The banks stick with their ledgers and the 'sufficient' security offered by the emerging pin-and-chip cards. With Moore's law ensuring ever more processing power, the implementation of the large database systems to implement a ledger payment eventually became so efficient that each single transaction was effectively free of costs. The European standards group TC224 WG10 that de Jong had joined in 1991 to initially develop card application standards beyond the ISO, was shutdown in 2009.

In terms of electronic cash not gaining much traction with the public, Danmønt is perhaps a notable exception. Through its integration with the Danish launderette system, Danmønt enjoyed levels of usage and social penetration beyond most other implementations, managing to stick around until 2005. The relative success of Danmønt holds lessons that need to be examined in future experiments.

'They (electronic cash systems) worked technically, but there is no longer an incentive to actually make them work commercially.'

While interest in smart cards for banking settled on deploying PIN&Chip, another application of a ledger-based smart card system had been enjoying huge successes. The telecommunication industry had focused its attention on smart cards to use in the then emerging mobile telephony industry. To support mobile telephony the Telecommunications Commission of the CEPT (Conférence Européenne des Postes et Télécommunications) had created a standardization group, GSM (Groupe Spéciale Mobile, and later renamed as Global System for Mobile Communications). By 1989, its first phase of specifications were approved based on the ISO standards for card size and communication. Once the European (and later global) standard was developed, phone-embedded GSM smart cards enjoyed a ready-made (phone) market and were very easy to mass produce.⁹

9. Thomas Haug, 'A Commentary on Standardization Practices: Lessons from the NMT and GSM Mobile Telephone Standards Histories', *Telecommunications Polic* 26 (2002): 101-107.

‘What really takes off with smart cards is GSM. There was a made-in-heaven combination of technologies and that led to the take off of the smart card production. At one point banking would do about 100 million smart cards a year, and there were 3 billion smart cards in phones, per year.’

Smart card manufactures were interested in the success of the GSM standard because it allowed them to make secure transactions and encrypt communication. Handset manufacturers were equally invested because the standard would allow them to focus on making machines that would do the radio communication and network deployments, which made the link between the phone and the person. Common interest resulted in the fast implementation and deployment of a chip-based secure model for wireless phones – the GSM standard – in 1998. The standard had two central goals: *protect the communication* and *ensure its payment*.

‘The privacy threatening nature of centralized accounting [...] if there is anything that David inspired in me, it is the concern of fundamentally privacy sensitive systems.’

Privacy and security had been the quintessential concerns for much of the developer and hacker community. Chaums’ invention of blind signatures was specifically motivated by the protection of privacy. It was a clear political motivation. He is on the record stating that, ‘The difference between a bad electronic cash system and well-developed digital cash will determine whether we will have a dictatorship or a real democracy’.¹⁰ Cash and ledger systems manage two fundamentally different types of value transfer messages. In the former, the message *is* the value and in the latter the message is an *instruction to transfer* a value. E-Cash, Danmønt, and Mondex differed in terms of cryptography and architecture, but they were all *cash* systems. The information stored in the cards was itself spendable. To lose a card meant losing the money. With ledger systems, where the message only carries information about the transfer of value, the actual transfer happens later. The ledger generates centralized traces of all activity and these are almost always tied to accounts with real identities. The existence of the ledger is why losing a credit or debit card doesn’t necessarily mean losing money (because an individual *account* is kept at a distance from the media and messages that inform the ledger about transactions), and equally why ledger-based transactions are not difficult to reverse (because the ledger is the actual site of the transaction). The same attributes of the ledger that separate message from transaction and enable reversibility, make it a political target for people like Chaum.

Money had been what de Jong refers to as ‘transubstantiated’ into electronic information much earlier than the birth of digital cash. In the 1920s Amsterdam had seen the first automatic ledger system, processing transactions by updating account cards with mechanical retrieval and sorting. For de Jong, the ledger is the crucial technology – or ‘cultural technique’ – that transforms money into information for the

10. ‘How DigiCash Blew Everything’.

first time. This 'other great transformation',¹¹ sets the quest for the re-creation of the *qualities* of cash into motion. Ledgers are anathema to supporters of digital cash.

In the 1970s, electrons are being stored in silicon in early phone cards to represent a stored value, still a good ten years before magstripe technology used the ledger system to identify account information on paper slips or with a networked connection. Telco companies like GSM used a ledger system that was a lot simpler than those of the banks, but it was nevertheless a centralized accounting system designed to keep efficient control of airtime through its quantification, and reconciled with monthly payment or a prepaid account. The step from this purely administrative system to a transfer and ultimately a payment system, like the one used today in mobile money transfers, was not a big one. Indeed, the cost of entering a ledger transaction approaching zero, combined with the ability to buy discrete quantities of airtime (made possible by an efficient database implementing the ledger), was enough for phones to become money systems with no initial strategic oversight. Phones had slowly become money-machines, technologies of payment, which is not the same as exchange. Payment *colors* exchange, it augments but also colonizes it in various ways. We are dealing with payment when all of the mirco-mediations of exchange are understood as forming a value chain, as comprising a unique political economy. This process of phones becoming payment machines partly explains what happened in Kenya with M-Pesa.

'Apart from cash (notes and coins) all the money systems are ledger based. Everything is balances, records of aggregated amounts received and paid. Every balance has an identifier attached, an account, and that identity-based accounting is the core of banking. We can criticize the use of the system, but the system is all that exists. Our current money system has proven itself a very close fit with a wide array of societal needs. Maybe we haven't realized how integrated it is into society. By trying to create alternatives, you discover how finely tuned traditional money is to all kind of needs in society.'

The recent proliferation of cryptocurrencies modelled after or inspired by Bitcoin, enact a novel combination of cash and ledger systems. In these systems, the ledger is hosted across multiple servers and geographically decentralized, but the ledger very much remains the foundation of these systems. Indeed, in some ways these systems are even more centralized because – at least in the minds of believers – the ledger becomes the ultimate authority, with no possibility for appeal if things go wrong. The ledger is conflated with sovereign authority.

De Jong says there is once again an interest in cash systems. For him, digital cash is a spectre haunting the new ledger-hybrids. Right now he is working on a community currency system, capable of integration with existing currencies. Its protocol uses asymmetric security, allowing the payer to be stay anonymous but not the payee, as in traditional cash payments, and will be usable through a phone user interface. There are plans to deploy it in Canada.

11. Karl Polanyi, *The Great Transformation: The Political and Economic Origins of Our Time*, 2nd edition, Boston, MA: Beacon Press, 2002.

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**GO CROWDFUND
YOURSELF!
SOME UNINTENDED
CONSEQUENCES OF
CROWDFUNDING
FOR DOCUMENTARY
FILM AND INDUSTRY
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INGE EJBYE SØRENSEN

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INGE EJBYE SØRENSEN

Since Kickstarter pioneered online crowdfunding in 2009, this form of financing has entered the mainstream as a way to co-fund projects, ventures, and startups. Today there are more than 95 crowdfunding sites in the U.K., up from 87 in 2013. Increasingly sites specialize in different industries, types of projects, and funding forms. For example, Kickstarter and Indiegogo are the largest pledge and reward-based platforms for creative projects; Seedrs caters for start up businesses; Sponsume innovators and social enterprises; and Gambitious connects game developers with investors. In 2013, £360 million was raised through a variety of crowdfunding models: donations, reward-based pledging, peer-lending, patronage, royalty and equity in the U.K. alone,¹ and a study for Nesta estimates that this could rise to £15 billion per year within five years.² Consequently, this form of funding has won the attention of politicians, legislators, academics, and the business community. Barack Obama described crowdfunding as ‘game-changing’³ and the U.S. and U.K. legislated for equity funding in 2012. This year, the EU is creating a pan-European workgroup to explore the potential and pitfalls of crowdfunding. These developments and the progressively more complex crowdfunding types and models, warrant a critical review that interrogates the intended and unintended outcomes of crowdfunding, here for documentary films and the documentary film industry.

The crowdfunding of creative productions has been analyzed by a growing number of scholars across disciplines. Florian Danmayr compares different funding platforms and the regulation and legislations surrounding them. Yet new issues around Intellectual Property (IP) and co-ownership of crowdfunded projects continue to emerge, as for example the debates around who really owns the initially crowdfunded Oculus Rift (and consequently should benefit from Facebook’s \$2 billion acquisition of) have illustrated.⁴ Similarly, Ordanini, Miceli, Pizzetti, and Parasuraman explore the motiva-

1. This figure is the sum of equity, donations, reward-based, and revenue-sharing profit crowdfunding in this report by Liam Collins, Richard Swart, and Bryan Zhang, *The Rise of Future Finance*, London: Nesta, Berkeley and University of Cambridge, 2013.

2. Nesta, <http://www.nesta.org.uk/news/uk-crowdfunding-platforms-50-cent-2013>.

3. Alex Fitzpatrick, ‘Obama Signs “Game-Changing” Crowd-Funding Jobs Act’, *Mashable*, 5 April 2012, <http://mashable.com/2012/04/05/jobs-act-signed/>.

4. Some of the implications of crowdfunding for IP are discussed by, for example, Nicholas Wells, ‘The Risks of Crowdfunding: Most Have the Best Intentions When It Comes to Crowdfunding an Ambitious Project, but Intellectual Property Issues, Ownership Rights and Perk Obligations Present Potential Hurdles to Making a Dream Become Reality’, *Risk Management* 60.2 (2013): 102, and John Reidl, ‘Crowdfunding Technology Innovation’, *Computer* 46.3 (2013): 100-103.

tions of crowdfunders on pledge and donation platforms, however, since legislation on equity funding has only recently come into force there is still much more work to be done in this area. The impact of crowdfunding practices, peer effects and crowd behavior on the success of projects has been explored by amongst others, Belleflamme, Lambert and Schwienbacher; Ward and Ramachandran; and Sørensen. However, few have considered the wider industrial and socio-economic implications of this funding form for existing and established industries and economies.

Similarly, crowdfunding in relation to specific art forms and audiovisual genres has received little academic attention. This despite the fact that different art forms clearly play out and perform differently, on distinct crowdfunding platforms, due to their inherent characteristics, production models, and the structure of their respective industries. For example, games outperform other genres across most pledge and donation-based platforms. This is possibly because the gaming community is closely affiliated with the online community, and because key stages of the development of a computer game can be showcased before its release. This allows games creators to spread out the crowdfunding campaign(s) to finance different stages of the production and also to increase donations by incorporating stretch goals in their campaigns. Film production also attract substantial crowdfunding across platforms, and the practice of offering investors in feature films 'executive producer' credits, has rolled out beyond Hollywood and translated into the crowdfunding platform Junction (jct.com) that specializes in equity financing of film for funders with a net worth of over \$1 million U.S. dollars. Junction's creator Dominic Patten sums up the rationale of the platform in this manner: 'The real selling point here is the access and that the new Hollywood newbie investors get the same terms as the original investors.'⁵ Furthermore, and in marked contrast to the popular conception of crowdfunding as creating an equal playing field for film makers and democratizing the film production process, the crowd seems to favor a less diverse group filmmakers and often prefer to support established talent with track records and name recognition.⁶ Documentary film budgets are often significantly lower than those of fiction films and Morozov and Sørensen have explored whether crowdfunding, as the hype will sometimes have it, could offer a lifeline to independent documentary film production in a time of declining budgets. However, as a funding model for documentary film, crowdfunding has the inadvertent consequence that only certain types of documentaries are funded. Typically the crowdfunder is more likely to favor high profile, issue-led films and polemical documentaries at the expense of, for example, investigative journalism, poetic-reflexive documentaries and drama-docs.

This body of research has been invaluable in explaining the dynamics and mechanics of crowdfunders and the crowdfunding process: the 'front end' of production. However, the story of audiovisual projects rarely ends with the finished product and each stage – development, financing, production, distribution, and exhibition – must be seen as an interconnected part of the dynamics of the documentary industry, economy and ecology. I will therefore shift the focus from individual films and filmmakers to explore the wider implications of crowdfunding for the documentary film distributors, film festi-

5. Ben Child, 'Tom Hanks Film Seeks Crowdfunding via "Kickstarter for the Rich" Site', *The Guardian*, 27 March 2014, <http://www.theguardian.com/film/2014/mar/27/tom-hanks-film-crowdfunding-kickstarter-junction>.

6. See Brabham's, Mollick's, Morozov's, and Sørensen's research.

vals, broadcasters as well as the documentary film industry at large. The scope of this paper is the documentary industry in the U.K. but there are similarities across countries in Europe and the U.S. I take a 'follow the money approach' and will make the case that in the final analysis it is not the crowd-funded documentary makers who benefit most from crowdfunding. This method of funding documentary content benefits and feeds into established funding and distribution models. It is the film festivals, distributors and broadcasters that gain and profit the most from such a system. Rather than providing an alternative to existing production and distribution structures, crowdfunding more often than not feeds into, supports and enforces traditional production and distribution paradigms and hierarchies.

In Defense of Crowdfunding

For a nuanced perspective on the discourse around this funding form we need to take issue with more romantic popular perceptions and descriptions of online crowdfunding as democratizing documentary making, and allowing creative expression beyond the traditional gatekeepers – this is not to reject the idea of crowdfunding *per se*.

Crowdfunding is not a new way to raise funds for films, but rather an online version of the patronage model that has funded all art forms throughout history. For instance Emile de Antonio's 1968 Oscar winner *In the Year of the Pig* was funded through sponsor parties.⁷ Indeed online crowdfunders often describe themselves in philanthropic terms when they explain their reasons for donations.⁸

In principle, using crowdfunding to support any creative endeavors that would otherwise struggle to come to fruition can only enrich cultural expressions across the world. Brilliant and compelling documentaries of global significance have been funded in this manner. Franny Armstrong's *Age of Stupid* is widely credited as one of the first documentaries to be crowdfunded and distributed online (in fact this film was funded through Spanner Film's self-organized profit-sharing and peer-lending scheme and not through an online crowdfunding platform). Anthony Baxter's *You've been Trumped*, a documentary about the controversy surrounding Donald Trump's development of a golf course in the Scottish Highlands, would not have been realized without several crowdfunding campaigns on Indiegogo. Initially, this film was rejected for funding from BBC and Channel 4, the U.K.'s two public service broadcasters (and the commissioners of the vast majority of documentaries in the U.K.), as well as from public film funding through the national arts funders Scottish Screen (now Creative Scotland) and the BFI (British Film Institute). Only after its completion, was the film acquired and shown on BBC's *Storyville* strand in the U.K.. It then won numerous prestigious international awards and was distributed across the world. In the U.S., where the public finding of documentary films is almost non-existent, the crowdfunded documentary *Inocente* won an Oscar in 2013. Crowdfunding has also become a vital funding avenue in repressive or totalitarian regimes and countries where public funding is not awarded to dissenting or non-conformist film makers, or to

7. Jane Chapman and Kate Allison, *Issues in Contemporary Documentary*, Cambridge: Polity, 2009, p. 104.

8. As noted by Ethan R. Mollick, 'The Dynamics of Crowdfunding: An Exploratory Study', *Journal of Business Venturing* 29. 1 (2014), as well as Paul Belleflamme, Thomas Lambert, and Armin Schwiendbacher, 'Crowdfunding: Tapping the Right Crowd', paper presented at the International Conference of the French Finance Association (AFFI), 11 May 2011.

documentaries with what is seen as subversive topics. In China Ai Weiwei funds his films through crowdfunding and in Turkey the LGBT community have crowdfunded a number of films to raise awareness and focus attention on the concerns of these groups. The world would indeed be a poorer place without these films.

It's the Distribution, Stupid

The reason we know about the documentaries previously mentioned is that while initially crowdfunded they were eventually broadcast, shown in festivals or distributed through traditional and established distribution channels. They featured in the press because they were reviewed, promoted by the distributors, broadcasters or festivals that screened them; because they won accolades at festivals; or were nominated for awards like the Oscars or BAFTAs.

These crowdfunded documentaries benefitted from being picked up by traditional distributors and screened at established outlets in several ways. They increased their reach and audience numbers through being shown at festivals and aired by broadcasters. In addition to delivering bums on seats and eyeballs for the documentaries these organizations also have press departments, officers and PR machines that promote their programs and schedules, and, by extension, these films. The accolades and reviews that the PR departments of these institutions can ensure in turn serve to distinguish these documentaries from all the other films that are also made. This is further enforced by the cultural and symbolic capital attached to these traditional distributors and outlets: put simply it is still more prestigious to have one's documentary on BBC than on YouTube, and a premiere at Sundance still has more traction than a pop-up screening. Moreover, filmmakers have to be screened at festivals to obtain formal industry and peer esteem, because films either need to have a cinematic release or be screened at feeder festivals in order to enter into competition for a BAFTA or an Academy Award. As a consequence, documentary makers naturally want their films to be shown at big-name festivals, in cinemas and on TV networks channels.

The Documentary Economy and Ecology in the U.K.

On the surface this should be a win-win situation for documentary films and their makers: crowdfunding allows more documentary makers to make more documentaries, and some of these secure significant exposure through traditional outlets. However, there are several problems with this.

Declining Documentary Budgets

In the U.K. the majority of documentaries, 79 percent,⁹ are funded by the four terrestrial broadcasters who commission and upfront and outright fund 100 percent of the entire production. The broadcasters then have the right to show the documentary twice, after which the rights to the documentary return to the documentary maker. With this follows the rights to resell the documentaries to other broadcasters, international distributors or outlets like Netflix and Lovefilm. The British model of funding documentary films is different from most other European countries, for example Denmark where co-production and co-funding is the main form for funding films, and the U.S. where deficit funding is the

9. PACT, *Pact Policy Survey and Financial Census 2009*, London: Oliver & Ohlbaum Associates Ltd., 2009, p. 14.

norm.¹⁰ However as the world's second largest producer and exporter of documentaries, what is happening within the British documentary industry is of global importance.

In recent years, the overall budgets for factual programming, including documentary film, have fallen in the U.K.. There has been a 22 percent fall in documentary budgets over five years, from a total spend of £585 in 2007 to £455 in 2012, as Figure 1 illustrates. In this same time period the number of hours of factual programs and documentary films has gone up. The net effect is that the budget per film is declining.¹¹

Moreover there has been a polarization of budgets, so that high profile projects have more finance behind them than other productions.¹² This is eroding the budgets for more independent types of documentaries further.

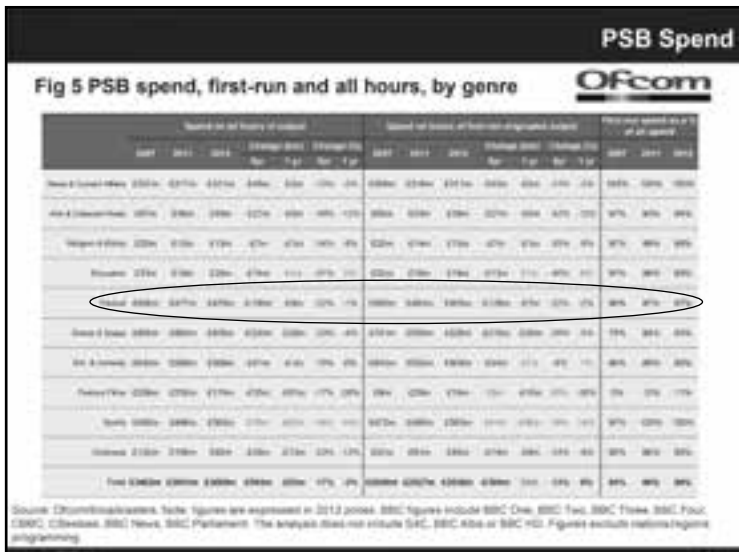


Fig. 1: Source: Ofcom's Public Service Broadcasting Annual Report 2013

10. Gillian Doyle, *Understanding Media Economics*, 2nd edition, London: SAGE, 2013, pp. 111-114.

11. These figures are from Ofcom's *Public Service Broadcasting Annual Report 2013*, London: Ofcom, 2013, pp. 9 and 16. However, Ofcom's statistics as well as the BBC's and Channel 4's annual reports conflate factual programming and documentary in a 'factual' category and it is therefore impossible to discern the exact proportion of documentary films in relation to factual programming (e.g. cookery, DIY, travel programs, etc.) without conducting a full content analysis of the respective broadcasters' schedule. Added to this, varying definitions of what a documentary film is would complicate such a breakdown of programming. Are Michael Palin's programs travel, food or documentary content, for example? However, given that the number of documentaries in the traditional documentary strands, e.g. *Panorama*, *Storyville*, *Unreported World*, *Cutting Edge*, *Horizon*, on average have remained stable over the past decade according to BFI's databases, though budgets have declined, it seems reasonable to assume that overall budgets per hour for documentary films have diminished. This trend is also mirrored by the fact that the over all spending on other categories where documentary films would also be included like 'Current Affairs' and 'Arts & Music' have also declined, as Figure 1 demonstrates.

12. Inge Sørensen, 'Crowdsourcing and Outsourcing: The Impact of Online Funding and Distribution on the Documentary Film Industry in the U.K.', *Media, Culture & Society* 34.6 (2012): p. 734.

In addition to the broadcasters' declining investment in documentary films, feature-length documentary films received little support from the public film funders like the BFI and the regional and national screen offices. This has caused concern for industry professionals and academics alike. In March 2014 David Hickman, documentary-maker and senior lecturer in Film & Television Production wrote:

...there is little significant contribution to British documentary from the Big Three U.K. film funders, the BFI, BBC Films and Film4. Despite the widely acknowledged fact that feature documentary has been in something of a "golden age" in recent years, the idea that these key institutions of British film should support feature documentary seems to have largely passed them by. As things stand, feature documentary makers seeking support from the BBC have one destination: *Storyville*, a cash-starved ghetto within BBC television. It's a similar story with Channel 4 – the funds available for feature documentaries are vanishingly small.¹³

Nick Fraser, Series editor of BBC *Storyville* noted the same trend as early as 2009:

Documentary-makers were very worried about being overcome by Big Brother and "Big Mac" docs, but I think that phase has passed and the worry is now much more basic. These people are working for nothing. We're talking such small amounts of money, it's getting alarming.¹⁴

It is in this economic climate that documentary makers are turning to crowdfunding to produce their films. However, paradoxically, crowdfunding may in fact further erode documentary budgets.

Crowdfunding offers filmmakers and films many additional benefits beyond the purely monetary. For example, the process of crowdfunding allows filmmakers to create and nurture an audience for the film or audiovisual project before it is made, and can be used as a proof of concept of the project's viability. Also, the fan and funder base offer the filmmaker emotional and practical peer support, as well as create free viral promotion and advertising for the project.¹⁵ These benefits pertain to crowdfunded projects across genres and industries as research by Ordanini et al. and Belleflamme et al. has shown. Also, crowdfunding allows filmmakers to produce films outside of the established funding structures and traditional gatekeepers. This means greater creative freedom for the filmmakers who do not need to adhere to institutional guidelines and requirements, or to take into account editorial and creative contributions from funders and commissioners. However these benefits come at a less visible price.

13. David Hickman, 'Documentary Funding Gap Stalls Great Films Like the Act of Killing', *The Conversation*, 6 March 2014, <http://theconversation.com/documentary-funding-gap-stalls-great-films-like-the-act-of-killing-23737>.

14. Nick Fraser is cited in David Cox, 'Is This the End of the Line for the Impartial Documentary', *The Guardian.co.uk*, 9 November 2009, <http://www.theguardian.com/film/filmblog/2009/nov/09/sheffield-docfest-documentary-films>.

15. Franny Armstrong relates her perceived benefits of crowdfunding in an interview with Inge Sørensen. Full transcript in the appendix of Sørensen's PhD diss., *Documentary in a Multiplatform Context* from the Department for Media, Cognition and Communication, Copenhagen University, Denmark, 2013, http://curis.ku.dk/ws/files/44584781/Ph.d._2013_S_ørensen.pdf.

Although commissioners and film funders do not have the editorial input and control over these films in their pre-production or production stages, having a pool of crowdfunded and already made documentaries at their disposal has other advantages. Rather than commission ideas and proposals from scratch, broadcasters can simply choose between a bigger slate of readymade films to air on their schedules. This makes economic sense. Documentary budgets in the U.K. vary but, on average, a primetime documentary on BBC or Channel 4 will be commissioned for around £150,000-200,000. However, if the film is already produced, the resell value is significantly less. Again, prices vary and exact terms of trade are contractually confidential. However, according to six industry insiders, feature documentaries are regularly bought for BBC's *Storyville* and the Danish DR's *Dokumentation* strand for as little as £1500.00.¹⁶ In short, instead of an upfront commission for a documentary that previously may have cost £150,000, the broadcasters can now acquire a similar finished product for a fraction of the price.

Moreover, as well as being able to choose from a wider selection of documentary films than they would have been able to commission themselves the acquisition of these films is totally risk free. Rather than taking a chance and investing on the basis of an idea or a proposal, then having to deal with the uncertainties and allow for the risks involved in any creative process and production, broadcasters can now view the finished product before buying it. Commissioning editors thus have less direct editorial influence and creative input into the individual film in the funding, development and production stages, but they can choose from a bigger pool of pre-produced products at reduced price and with no creative risk. In this way, broadcasters now have more influence over the composition of their overall schedule or stand than ever before.

It is a similar scenario for documentary film festivals. The success and esteem of a festival depend on constructing the best possible programs from as varied and as large a pool of completed documentaries as possible. There is a disproportional relationship between the ratio of the numbers of films submitted, the number of films selected and the profile of the festival: the more films submitted and the fewer selected, the more exclusive the festival. Moreover, the business models of most festivals are partly predicated on the submission fees that documentary filmmakers pay to submit their films to be considered for the festival. Thus increases in the numbers of films submitted results in more profit for the festival.

Documentary makers of course know this. However, for all the reasons listed above, documentary festivals and broadcasters are still the place where documentary filmmakers and producers want – and need – to show their films. It is a buyer's market, because it is the TV stations, festivals and distributors who can find audiences, promote and turn a profit for the films. Although more documentaries are produced and funded through crowdfunding, it is the traditional gatekeepers who still decide on what gets shown and where. They have the oligopolistic power and clout to say 'yes' or 'no' – and now this comes risk free and for a much lower price.

16. Four documentary makers have related this figure in personal communications with the author.

Regulations, Legislation, and Professional Standards

There are also wider societal issues and practical industrial problems with production and funding outside of the traditional funding and commission structures. Full funding from public funders and commissioners goes some way to help ensure – at least in principle – the integrity of the documentary films they fund, the editorial and journalistic standard to which these are made, and the working conditions of the crews working on documentary productions.

Terms of trade and compliance procedures are part of the contractual agreements between public service TV networks or public funders, and the production companies that they commission or fund to make films and content. These contractual agreements ensure that productions adhere to professional standards, health and safety policies, and working standards for cast and crew. However, there are no rules, guidelines or legislation governing projects that are funded and produced online and outside of the legacy funders and commissioners. Therefore there are no safeguards that guarantee that producers adhere to industry standards, working practices, conditions or rates set out by unions or alliances like PACT (representing production companies in the U.K.), NUJ (the National Union of Journalists), BECTU (the union for crew) or Equity (the union for cast). Crowdfunded productions are not regulated, and therefore there are no assurances that media workers working on these projects are adequately insured, sufficiently trained or working to professional standards. This has the potential to undercut industry rates and undermine working conditions for media workers.

Similarly, the editorial standards and attributes traditionally associated with documentary are potentially challenged in crowdfunded projects. Notions of ‘balance’, ‘impartiality’, and ‘objectivity’ have been safeguarded by the TV networks’ producer guidelines and codes of conduct that producers must adhere to when producing for the BBC and Channel 4. IP is protected by compliance procedures. Online there are no such guidelines or procedures. Moreover, a funding process that is open to all investors can potentially compromise the integrity of a project, especially if it is a documentary film. Money corrupts, and in crowdfunding it can be hard to tell where the money is coming from. As Nick Fraser, the BBC’s series editor of *Storyville*, puts it: ‘If Dr Goebbels appeared with a huge sack of money, there would be documentary film-makers queuing around the block to take it.’¹⁷ Fraser’s point is valid: notions of impartiality and balance are hard to uphold, if a documentary is part funded by political parties, an NGO, pressure group, lobbyist, charity or business.

It is also worth noting that the main funders of documentary films in the U.K. – BBC, Channel 4, BFI and the regional and national public funders – all have public service remits. These are in place to ensure plurality, that a diversity of factual programming and documentary films are commissioned, expressing the full spectrum of viewpoints across society and catering for niche tastes and underrepresented audiences and well as those with popular and mass appeal. Crowdfunding platform have no such obligations. Although some crowdfunding platforms are charities, others are businesses.

17. David Cox, ‘Is This the End of the Line for the Impartial Documentary’, *The Guardian*, 9 November 2009, <http://www.theguardian.com/film/filmblog/2009/nov/09/sheffield-docfest-documentary-films>.

Their remit is profit or turnover, not plurality or making sure that a variety of films that represent a spectrum of voices are made. It is increasingly evident that the crowd favors films of mass appeal or those made by filmmakers with name recognition,¹⁸ and another casualty of crowdfunding could be diversity and plurality of productions and voices.

In these ways, an unintended outcome of crowdfunding is the potential for the accidental erosion of industry and professional standards as well as working conditions for journalists, filmmakers and crew within the documentary film industry. And with this crowdfunding could undermine the integrity and credibility of documentary film as well as the plurality and diversity of film and filmmakers. Ironically, although crowdfunding is hyped as democratizing the means and access to production, it could well have the reverse effect.

Go Crowdfund Yourself

Recently, the public funders, organizations and institutions have also begun to engage in and use crowdfunding to part-fund projects that they, until recently, would have fully funded. For example, in order to be eligible for funding through the publically funded, micro-budget film schemes *lo-fi* and *Mircowave*, it is a prerequisite for the filmmakers to crowdfund a certain part of their budget. Similarly, museums have started using crowdfunding to realize special projects and part-fund exhibitions. For example, Glasgow Women's Library raised £6,839 to publish a book inspired by its collections; Bowes museum raised £8,680 to commission an artwork by Graham Turk that was installed on the front of the museum as part of the exhibition of his work; and the William Heath Robinson trust crowdfunded £33,492 for a permanent gallery.

Donations and memberships have of course always been part of business model of museums, but taking these trends to their logical conclusion, why have public arts funding at all? The discourse around democratizing production and funding through 'crowds' and 'communities' is alluring, but it also chimes well with the Conservative British Prime Minister, David Cameron's Big Society, as Evgeny Morozov points out.¹⁹ One might, if of a neoliberal predisposition, wonder why the state should subsidize the eight percent who watch ballet and contemporary dance, when dance fans could just crowdfund it themselves. Or ask why people should not just pay as they go and fund what they want in museums? Crowdfunded documentary films always highlight the fact that they are crowdfunded in their promotional material and use this endorsement of the crowd as part of their legitimacy and relevance. However, behind the rhetoric and romance of democratizing both the ability to fund documentaries as well as to make them, lures the question of why films should be funded out of the public purse, when crowdfunding evidently shows that it is feasible to substitute public film funding with crowdsourced support. In short, one major but serious, unintended outcome of crowdfunding is the potential to undermine public arts funding.

18. As described by Inge Sørensen, 'Crowdsourcing and Outsourcing' and Darren C. Brabham, 'The Myth of Amateur Crowds: A Critical Discourse Analysis of Crowdsourcing Coverage', *Information, Communication & Society*, 15.3 (2012): 394-410.

19. Evgeny Morozov, 'Kickstarter Will Not Save Artists from the Entertainment Industry's Shackles: A New Study Says Crowdfunding Benefits Only Certain Kinds of Movies', *Slate Magazine*, 25 September 2012, http://www.slate.com/articles/technology/future_tense/2012/09/kickstarter_s_crowdfunding_won_t_save_indie_filmaking_.html.

In cultural economics it has long been acknowledged that artists subsidize the arts with their time, free work and self-funding of the development of projects.²⁰ Artists also subsidize each other by helping out colleagues, collaborators and prospective employers as part of their practice. 'Freebies' is an established term within creative work, and although not always recognized as such in economic terms, artists subsidize each other. However, with crowdfunding, so do the artist's families, friends and fans. Before simply extolling the wonders of crowdfunding as public arts funding, we need to ask ourselves how this funding form impacts not only on existing industries and funding structures but also on the arts and artists. To what extent is crowdfunding supplementing or distorting existing cultural and creative industries? Is crowdfunding a genuine addition and benefit to the arts and public funding, or is it simply artists and their networks swapping money, whilst public funding for cultural industries declines and arts funding falls?

Conclusion – The 'Needle in a Haystack' Problem

Documentary films perform a crucial role in exchanging and mediating knowledge and opinions in society. Carl Plantinga argues that the integrity and quality of non-fiction films is a precondition for the 'healthy intersubjectivity' that he sees as fundamental to the functioning of Western democracies.²¹ The conditions under which documentary films and content are produced are therefore of paramount importance. As crowdfunding increasingly becomes a way to fund these films it is necessary to highlight these unintended consequences for the documentary films industry.

Although crowdfunding provides some solution to funding and producing particular documentaries outside of the traditional and legacy systems, the wider documentary industry is still dependent on the traditional gatekeepers and media institutions for the promotion, distribution and success of its films. Documentary film production and distribution are parts of a network that is still dominated and controlled by established media institutions. As it stands, crowdfunded films still need the traditional distributors – festivals, cinemas and broadcasters – to reach their audiences. Similarly, in order to crowdfund online, artists, filmmakers and journalists rely on crowdfunding platforms and the surrounding industry of crowdfunding consultant and facilitators that have sprung. It is these organizations – not the creators, filmmakers and artists – that benefit most from crowdfunding.

New ways of organizing distribution and exhibition are emerging. Distrify provides peer-to-peer file and profit sharing software that allows people to share films on social networks and receive a cut of the download price. TUGG or Gathr bring together audiences for self-organized and on-demand screenings of documentary and feature films; and VOD services (iTunes, Netflix and Amazon Prime) and advertising supported streaming (YouTube) provide alternative outlets for documentary makers. However, these systems have still to accumulate critical mass and popular support, and have yet to demonstrate the reliability, financial returns and promotional infrastructure that the traditional distribution and exhibition networks command.

20. Ruth Towse, *Advanced Introduction To Cultural Economics*, Cheltenham: Edward Elgar Publishing, 2014.

21. Carl R. Plantinga, *Rhetoric and Representation in Nonfiction Film*, Cambridge: Cambridge University Press, 1997, p. 219.

For crowdfunding to be a viable business model for filmmakers and the documentary film industry, new sustainable peer-to-peer distribution routes and exhibition networks that are not predicated and dependent on legacy media outlets need to emerge. These need to have the reach and promotion to be able to bring audiences to films, to curate documentaries to ensure their consistency and quality, as well as to generate the reviews, awards and accolades that will bring quality crowdfunded projects to the surface without distorting and undermining the existing funding systems. Also, mechanisms of safeguarding working conditions, professional and editorial standards need to be put in place for productions funded on crowdfunding platforms. Only then will crowdfunding be able to live up to the current hype about democratizing the production of documentary films, and offer a truly viable alternative to existing funding models.

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CROWD+FUNDING THE COMMONS?

RENÉE RIDGWAY

CROWDFUNDING THE COMMONS?

RENÉE RIDGWAY

Crowdfunding is currently celebrated as the alpha and omega of the arts together with an entrepreneurial rhetoric in the cultural and public sectors. As many governments around the world continue to cut budgets for these sectors and promote private partnerships (sponsoring), citizen patronage is on the rise. The phenomenon of crowdfunding continues to flourish, 'in 2013 the crowdfunding industry grew to be over \$5.1 billion worldwide'.¹ In 2013 in the U.S. crowdfunding behemoth Kickstarter surpassed the NEA (National Endowment of the Arts), which is not surprising in a country where private money has almost always provided more support than governmental institutions for the arts.² A recurrent criticism is whether these types of 'private microdonations' are really there to combat the budget cuts and austerity measures, or will they actually undercut funding from the public sector, financed by taxpayers' money.³ With public resources for the arts dwindling worldwide and individual patronage becoming the norm, digital platforms are enabling private transactions at an even quicker pace due to the technological advancements of payments and the widespread dissemination of crowdfunding campaigns on social media. If individual surplus is transferred to 'friends' in the network as gifts or in return for perks or tokens on reward crowdfunding platforms, will the network in turn be able to effectuate this increasing demand in donations for the pre-financing of not only art projects but the development of 'public' or 'civic' infrastructures?

We have also witnessed the growth of collective online platforms that use crowd-sourced initiatives for the social good, or commons, deemed 'civic crowdfunding'. Although volunteering time has always been a 'neighborly' thing to do, by helping out friends, family, and colleagues, more and more people are reaching into their social networks to ask not only for favors, but also for monetary 'gifts'. In the U.K. currently, the Big Society 'nudges' taxpayers to contribute to society, and in turn people 'nudge' their friends (or neighbors) for cash to causes they feel are important, yet ostensibly don't have the money to finance themselves. In this way, there is increasingly a movement where folks rally around a shared concern, or community cause. 'Civic crowdfunding' has now found its place between rewards-based, equity-based, and lending-based crowdfunding initiatives.

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1. Daniel Broderick, 'Crowdfunding's Untapped Potential in Emerging Markets', *Forbes*, 5 August 2014, <http://www.forbes.com/sites/hsbc/2014/08/05/crowdfundings-untapped-potential-in-emerging-markets/>.
 2. Kickstarter, 'Stats', <https://www.kickstarter.com/help/stats>.
 3. Renée Ridgway, 'Crowdfunding: Monetizing the Crowd', *n.e.w.s.*, 2 March 2014, <http://northeastwestsouth.net/crowdfunding-monetizing-crowd>.

With crowdfunding as a contemporary means to enable creative endeavor, civic projects, or community activism, one cannot overlook Goteo, a social network for collective funding (monetary and non-monetary contributions) for distributed collaboration (services, infrastructure, and other resources). Located in Spain, Goteo is a platform that attempts to foster development for the benefit of more than one individual author and promotes social goods, which in turn will improve society and enrich common resources. Ostensibly the 'social return' is embodied through drawing on its network for support facilitated by online transactions of money, alternative forms of payment, or barter. In which ways does Goteo differ from other crowdfunding platforms with its free knowledge, open code, and collaborative approach?⁴

Reward Crowdfunding

Most crowdfunding initiatives offer rewards, or perks for monetary contributions. Whether these are deemed purchases is still controversial, but legislation for taxation is in the works.⁵ Rewards vary from campaign to campaign, which usually have an 'all-or-nothing' model meaning that the campaigner has to obtain the full amount and reach the goal, otherwise the funds need to be returned to donors. The 'keep-it-all' model lets the campaigner or promoter retain whatever s/he has raised in the campaign. Reward crowdfunding is progressively popular and has financed campaigns by famous musicians asking for support for their tours⁶ or uncompressed sound,⁷ as well as for film directors' forthcoming movies,⁸ where many fans willingly donate small (and large) sums of money to make it all happen. These rewards, or pre-sale products, vary in range but are connected through the interest group, just as campaigns for design gadgets that are cool⁹ have a community of users who want hip commodities.¹⁰ Continuing this trend, acclaimed artists crowdfund as a means to invest in eponymous real estate ventures for long-durational performance art, collaborating with leading architects,¹¹ while a prestigious art fair teams up with Kickstarter to support non-profit visual arts organizations through a 'rigorous selection process' involving a hand-picked jury.¹²

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4. For this article I contacted Goteo directly and conducted an online interview on 12 September 2014 with María G. Perulero, their campaigns representative.
 5. Income tax is collected from the campaigner and the donor may be able to write-off the contribution as a tax deduction.
 6. Joshua Clover, 'Amanda Palmer's Accidental Experiment with Real Communism', *The New Yorker*, 2 October 2012, <http://www.newyorker.com/culture/culture-desk/amanda-palmers-accidental-experiment-with-real-communism>.
 7. Ben Beaumont-Thomas, 'Neil Young's Pono Becomes Third Most Successful Kickstarter Ever With \$6.2m', *The Guardian*, 16 April, 2014, <http://www.theguardian.com/music/2014/apr/16/neil-young-pono-kickstarter>.
 8. Kickstarter, 'The Newest Hottest Spike Lee Joint', <https://www.kickstarter.com/projects/spikelee/the-newest-hottest-spike-lee-joi>.
 9. Kickstarter, 'Touch Board: Interactivity Everywhere', <https://www.kickstarter.com/projects/863853574/touch-board-interactivity-everywhere>.
 10. Kickstarter, 'Pebble: E-paper Watch for iPhone and Android', <https://www.kickstarter.com/projects/597507018/pebble-e-paper-watch-for-iphone-and-android>.
 11. Kickstarter, 'Marina Abramovic Institute: The Founders', <https://www.kickstarter.com/projects/maihudson/marina-abramovic-institute-the-founders>.
 12. For more about the jury process see: <https://www.artbasel.com/en/Crowdfunding/Discover-Projects>. The initiative can be found here: <https://www.artbasel.com/crowdfunding>.

Equity-Based Crowdfunding

Unlike reward or donation based crowdfunding, equity-based incentives offer a long-term investment in a start-up, a business venture, a project or even just an idea. 'A new development within the crowdfunding industry is the so-called equity-based crowdfunding: as a reward investors receive unlisted shares of a company.'¹³ Instead of the financial obligations of paying back loans with interest, with equity-based crowdfunding entrepreneurs have lower risk by raising money from non-accredited investors. These individuals or organizations provide equity in a collective effort to stimulate small businesses. For example the JOBS Act (Jumpstart Our Businesses) has been signed into law in the U.S., which eases security regulations, creating exemptions for crowdfunding in order to democratize investments.¹⁴ Companies can sell online securities through the crowdfunding platforms much like microfinancing loans, however 'without requiring those companies to provide meaningful disclosure and without adequate oversight by the Securities and Exchange Commission'.¹⁵

P2P Lending

As banks increasingly command the political agendas of the state, the public reaction is to rely on micro-financing in the form of crowdfunding as an acceptable means of borrowing money. Many citizens have lost trust in the banks, which is why certain high-net-worth individuals lend money online with P2P crowdfunding. Lending platforms have skyrocketed and serve as middlemen to match investors with borrowers and to create agreed-upon terms. This type of lending comes out of an 'anti-bank' movement in which the platforms attempt to undersell the interest rates of the banks and the public wishes to borrow less from banks and more from private investors. Because of this anti-bank attitude more people are turning to 'peer to peer' platforms through crowdfunding, stating that they receive better interest rates online than with banks.¹⁶

Crowdfunding Whatever

The ethical implications of crowdfunding are becoming more controversial as communities find voice through their campaigns with a cause. Disputes range from issues regarding freedom of speech and discrimination, as well as the transparency of information involving these forms of fundraising. 'The American Freedom Defense Initiative, a radical anti-Islamic group, raised \$41,500 on Indiegogo (of a \$50,000 target) in May 2013 for an advertisement campaign warning against what it calls "the threat of jihad and Islamic supremacism"'.¹⁷

13. 'In the United States Equity Crowdfunding is only accessible for accredited investors, but this could change soon based on the JOBS Act. This is an exciting development for investors and also start-up entrepreneurs as this expands their possibilities of raising capital', Isabelle De Clerq, 'Untangling Peer-To-Peer Lending, Crowdfunding, and Microlending', *BTC Jam*, 24 July 2014, <http://blog.btcjam.com/2014/07/24/untangling-peer-to-peer-lending-crowdfunding-and/>.

14. JOBS ACT, <http://www.gpo.gov/fdsys/pkg/BILLS-112hr3606enr/pdf/BILLS-112hr3606enr.pdf>.

15. *New York Times Editorial*, 3 March 2011, 'According to some it is 'a terrible package of bills that would undo essential investor protections, reduce market transparency and distort the efficient allocation of capital', http://www.nytimes.com/2012/03/11/opinion/sunday/washington-has-a-very-short-memory.html?_r=0.

16. Paul Langley lecture at Copenhagen Business School, 'The Marketization of Crowdfunding: A New Digital Frontier for Finance', 8 September 2014.

17. Indiegogo, 'AFDI Jihad Awareness Campaign', <https://www.indiegogo.com/projects/afdi-jihad-awareness-campaign>. Cited from: Rodrigo Davies, 'The Ethics of Crowdfunding', Center for Digital Ethics and Policy, Loyola University Chicago, 17 December 2013, <http://digitaletics.org/essays/the-ethics-of-crowdfunding/>.

Concerns have been raised in regard to the platforms' terms of service, which explicitly state that they prohibit racial intolerance, hate campaigns, or other forms of exploitation. A moral controversy ensued at Kickstarter with a campaign for a guide on how to seduce women 'Above the Game'.¹⁸ As digital means facilitate payment systems that cross borders, the definition of nation-state, and its respective governmentality along with its responsibility is taking on new configurations. Some campaigns are directly related to financing private security forces, such as in Oakland, California, which raised over \$60,000 with the Crowdfunder platform to become a gated community with fences. While private security forces are common in the city, the campaigns were criticized for encouraging their growth and, due to the ease of creating and 'cloning' crowdfunding campaigns, causing a contagion effect that could undermine the role of policing. 'For the libertarian, this may be an encouraging development that supports the reduction of government spending. For the progressive, it is a threat to the nation state that risks widening existing social inequalities.'¹⁹

New gadgets for monitoring are also prevalent in campaigns such as Kickstarter's 'The Pocket Drone – Your Personal Flying Robot', which exceeded all expectations of its \$35,000 goal, raising \$929,212 from 1,946 backers.²⁰ Instead of hobbyists collating aerial footage of the vacation trips or neighborhoods, on the Ukrainian crowdfunding site The People's Project Ukrainians rallied together to buy the 'first people's drone' in order to aid the Ukrainian army in securing their border with Russia.²¹ 'The organizers had originally hoped to buy a state-of-the-art Israeli drone – for \$165,000 (£97,000) – or a cheaper American one costing \$120,000. In the end, however, they managed to build the drone for just \$35,000'.²² On the patriotic site one can also support uniforms, bullet-proof vests, camouflage gear and other badly needed supplies for the Ukrainian militia, helping them be better prepared in literally, a war zone.



18. Kickstarter, 'We Were Wrong', 21 June 2013, <https://www.kickstarter.com/blog/we-were-wrong>, and see Davies, 'The Ethics of Crowdfunding'.

19. Davies, 'The Ethics of Crowdfunding'.

20. Kickstarter, 'The Pocket Drone – Your Personal Flying Robot', <https://www.kickstarter.com/projects/airdroids/the-pocket-drone-your-personal-flying-robot>.

21. Peoples Project, 'First People's Drones', <http://www.peoplesproject.com/en/bpla/>.

22. Oksana Grytsenko and Luke Harding, 'Ukrainians Crowdfund to Raise Cash for 'People's Drone' to Help Outgunned Army', *The Guardian*, 29 June 2014, <http://www.theguardian.com/world/2014/jun/29/outgunned-ukrainian-army-crowdfunding-people-drone>.

Civic Crowdfunding

Whether the aforementioned campaigns would be considered civic is open to debate, but for many 'civic crowdfunding' is understood as a form of commoning, where people pull together to get things done, because they cannot depend on the state to organize nor resolve issues. Anti-government (or anti-state) attitudes are unified under volunteerism and community groups, offline in their hometowns and cities, online with the transfer of payments. These 'civic crowdfunding' campaigns can be for private, educational, community or charity projects and are mushrooming worldwide. Spacehive describes itself as the world's first civic crowdfunding campaign with the motto, 'if it's a public space, and popular with the public, Spacehive is for you'.²³ Other platforms nudge companies to pay attention, connecting community projects with businesses to create 'win-win' situations. Many companies are establishing partnerships, or jumping on board to make their businesses look more social, or for tax write-offs, depending on the legislation in their respective countries. Although Neighbourly enables cash donations or in-kind contributions, such as equipment, storage space, materials, employee expertise, the most desired involvement is that people volunteer, which means contributing for free.²⁴ Like Kickstarter, the preceding platforms are 'for-profit' entities²⁵, whereas lobby is a 'citizen-led neighbor funded' not-for-profit organization that strengthens neighborhoods through community resourcing.²⁶

Sharing Economy cum Platform Capitalism

Civic crowdfunding situates itself within the new economy of digital transactions, within the 'sharing economy' of services such as Uber, Airbnb, and TaskRabbit. Deemed also 'platform capitalism', the sharing economy offers temporary solutions to short term problems.²⁷ Although some would like to deem it P2P, these are predominantly profit-making entities and their core business model consists of a community of users who contribute and share resources between each other. Urban migration has resulted in people living in closer proximity to each other, enabling a distribution of tools, services, and even cars – as not only parking spaces but also the space of free time becomes more difficult to find. A model of speed and flexibility that attempts to overlook ideas of ownership and hyper consumerism of the past replaces this scarcity. More and more people desire services or the 'performance economy' instead of commodity production antiquated to the days of Fordism, when Henry Ford's model of production employed the workers in the factories to produce the commodities they would in turn buy with the surplus from their labor. Instead, what is being offered in exchange is their surplus: cars, spare rooms, equipment, services, and free time. This 'collaborative consumption', as it is called, is changing the way people engage with their networks and along with it, the definition of society and community. Where once people only stayed within

23. Spacehive, <https://spacehive.com>.

24. Neighbourly, <https://www.neighbourly.com>.

25. Kickstarter allows a tag for 'civic', although most of the projects are not 'civically' engaged. With their 'for-profit' status Kickstarter bought a building for \$3.6 million in Brooklyn as HQ, after the funds from venture capitalists. Matt Collette, 'New Kickstarter HQ May Jumpstart Greenpoint's Emerging Arts Scene', *The Brooklyn Ink*, 14 November 2013, <http://thebrooklynyink.com/2013/11/14/53262-kickstarter-greenpoint/>.

26. lobby, <http://ioby.org>.

27. Sascha Lobo, 'S.P.O.N. – Die Mensch-Maschine: Auf dem Weg in die Dumpinghölle', *Der Spiegel*, <http://www.spiegel.de/netzwelt/netzpolitik/sascha-lobo-sharing-economy-wie-bei-uber-ist-plattform-kapitalismus-a-989584.html>.

the boundaries of their known community, based on identity, kinship, familiarity, and the like, contemporary environments now facilitate people to connect to the society at large. It is this platform capitalism that conditions networks to come together, along with the monetization of the relationships that comprise the network.

From Crowdfunding to Crowdvocacy

Now let us return to Goteo (drip in Spanish). Its aims are social, cultural, scientific, educational, journalistic, technological, and ecological in order to contribute to the development of society, free knowledge, and open source. Drawing on an irrigation method for water used in arid climates that improves water usage, 'at Goteo monetary and other resources come in the form of *drops* from the crowd, naturally fertilizing initiatives to help them grow and favoring collective empowerment through digital means'.²⁸ Based on local and ideological proximity, enabling more reliable and effective bridges between producers and consumers, Goteo attempts to offer sustainability, shared authorship, and common goods, while fostering self-development of creative and innovative initiatives, which in turn improve society and enrich common resources.

Individuals, as well as collectives and companies are joining in. As Goteo celebrates 3 years in November 2014, €2,000,000 has already been accumulated through the platform, including matching funds from various partners from all over Spain. The social factor plays a considerable role, with citizens taking on the responsibilities of solving the demands of matching funding, dissemination and production in projects that transform society through communal action and collaboration in a social economy. Promoting media activism, openness, civil rights, and sustainability in regard to ecology, Goteo has a comprehensive agenda that 'involves public state and private agents, rather than becoming another means to concentrate wealth without any social end'.²⁹ With a motto of positive change with open and free knowledge, Goteo desires to empower citizens to create value for themselves, and not just financially.

According to Goteo, the digital commons works differently than the physical commons. Understanding the digital commons only comes with a deeper reflection on intellectual property including its many interpretations. By promoting the growth of the commons, along with supporting training and mixed forms of funding there is a (re)distribution of resources. 'Goteo remix[es] some patterns of corporate social responsibility so they approach open communities and its values, even for selfish or competitive interests, turning that into a reverse logic, which can start to modify internally the way companies and corporations affect our daily lives'.³⁰ The trick is to have continual 'innovation' on the site with engaged users, whereby the network shares tools, tests out the developments of software or inventions and participates in match-funding that embodies open source principles. The main task of the platform is to create a stable, trustworthy and efficient procedural environment that promotes transparency, training, and knowledge production. Along with this, the publishing of open source code that implements scalability and reproducibility are part of the core values that distinguish Goteo from other crowdfunding platforms.

28. 'Goteo, 'From Crowdfunding to Crowdvocacy: Here Come the Civic Makers', *Issue.com*, [#](http://issuu.com/goteo.org/docs/goteo-from_crowdfunding_to_crowdvoc).

29. Goteo, 'The Case of Goteo: From Crowdfunding to Cloudfunding to Expand Resources for the Commons', <https://goteo.org/blog/3317>.

30. Goteo, 'The Case of Goteo'.

Goteo's Social Contract

Another noticeable feature of Goteo is that it is run by a non-profit entity, Fundación Fuentes Abiertas, which is promoted by Platoniq.³¹ Started in 2001, this cultural organization combines a collaborative economy's philosophy with the ethics of free knowledge, operating internationally in a grassroots manner with selected, sustainability-oriented partners from the business world, academia, and public sector. Because of its 'non-profit' status, surplus is not kept through ownership but reinvested back into the organization. Moreover, Goteo receives certain tax benefits that further enhance donating and receiving support from a declared public utility when it supports 'open source' projects that in turn contribute to the commons. This is viewed as a pioneering step in engaging with 'free culture' in Spain.³²

For Goteo it is necessary to have a clear understanding between the campaign (promoter) and the foundation – how the money will be spent and on what. In the contract it is stipulated that the promoter needs to declare the description of the project and its objectives.³³ There needs to be transparency about the monetary resources that are requested with each campaign and 'to specify in advance the type of free or open license whereby such collective returns will be made accessible.' Training people how to be open is alongside recognizing the social value within the project. The foundation first signs a contract with the promoter, who has to generate a delivery within a period of one year, which serves as a guarantee for the backers. Once the campaign is accepted by the foundation, there is a workflow generated between the beneficiaries and promoters.³⁴ Goteo has around a 67 percent success rate and the 33 percent who are not funded receive feedback on how they can learn to better communicate their values, or which other funding opportunities may be available.

Crowdfun

'Open Crowdfunding' should be 'Crowdfun' which means 'open source itself, collective returns for the whole society and collaboration within the production process'.³⁵

31. Platoniq, <http://www.youcoop.org/>.

32. The managing body of Goteo is a foundation, whose mission is 'to share meaningful knowledge publishing on the internet in the form of code, data and/or digital files on free or open source licenses', and is therefore able to escape corporate finance taxes. While the government can charge taxes for selling (so there is income tax) there is an open standard of supporting copy left which means tax benefits for supporters and Goteo attempts to make the public aware of the difference.

33. Even though Goteo has a higher than average services fee (8 percent of amount obtained), this money is invested back into the collective that the Foundation is committed (obligated) to share with society. 'The Case of Goteo: From Crowdfunding to Cloudfunding to Expand Resources for the Commons', <https://goteo.org/blog/3317>.

34. 'In the first week the promoter needs to reach 20 percent. If they don't reach this amount the campaign most likely won't take off. This 20 percent is usually the immediate network of the promoter who have been approached for financial support'. Collective returns form the basis and that means implicitly to follow up with a good execution of the project, maintaining momentum to 'keep the ball in the air'. Interview with María G. Perulero (Goteo) 12 September 2014.

35. 'Goteo has a real community; a total 53,206 users until yesterday (12 September 2014) more than 50 percent (32,659) of them are backers. 4,447 of these are multi backers, contributing to others projects by giving money or with non-monetary (833) contributions. There are 1,955 who just collaborate. On average there are 120 for backers each successful project. The number of promoters, backing other projects is 102. Finally the numbers of promoters giving non-monetary contributions is 24'. Interview with María G. Perulero (Goteo), 12 September 2014.

Unlike other civic crowdfunding platforms, Goteo encourages promoters 'not to make rewards unless they are necessary'.³⁶ Goteo is also exceptional because of its two round model, where the promoter can decide if they want two rounds and the amount they will crowdfund. In the first round of 40 days it is 'all-or-nothing' if you do not reach the goal then there is no funding. In the second round of 40 days they have a 'keep-it-all model' that allows more flexibility and also enables improvements and optimization to the campaign. Goteo closely follows its promoters, sometimes spotlighting specific campaigns on the front page of the website. When the collective returns are delivered, they publish on open data journalism sites, or through partners.³⁷ Comments from users are encouraged and are available. However, like other online economies, the most successful projects go hand-in-hand with a strong reputational economy through social media. The trust that is acquired in digital reputation through crowdfunding enables other people to support others' projects and builds up the collective return.

PROJECT NEEDS



REWARDS



LICENSES



Non-Monetary Contributions

Goteo mentions that one of their goals is being able to accept contributions other than money and thus really generating a distributed or cooperative economy. Users are signed up to the platform in order to involve other members of the platform for support, some of them with non-monetary contributions, drawing on Goteo's personal network as 'crowd funding is not really about money and more about creating communities'.³⁸ In promoting a 'by the community, for the community and of the community' approach³⁹ there are also other ways of contributing, such as people offering time in exchange for

36. 'Goteo does not explore financial benefits, has no commercial benefits, that would be equity. Instead we have a donation crowd funding model with collective returns.' Interview with Maria G. Perulero (Goteo) 12 September 2014.

37. El Diario, <http://www.eldiario.es/colaboratorio/> or in partnership with the ECF, <http://www.culturalfoundation.eu/> or with dissemination through Shareable: <http://www.shareable.net/>.

38. Felix Stadler, 'Crowdfunding the Commons: Goteo.org Interview', *Shareable*, 13 June 2012, <http://www.shareable.net/blog/crowdfunding-the-commons-goteoorg-interview>.

39. Ridgway, 'Monetizing the Crowd'.

financial support, or laboring, or trading off one of their skills. Goteo emphasizes a collaborative model, where the promoter of the project explicitly expresses a list of non-monetary needs on their public page. Enabled by a supportive community, the commons is taken up into the production process bringing economic value, through a micro task infrastructure. Goteo deems this type of contribution 'altruistic', which can mean giving without necessarily expecting a return. Many of those who are signed up on Goteo are thereby users in the greatest sense of the word but also producers and contributors.



The Social Coin

Utilizing an outlook on expanding the development of alternative currencies, Goteo also hopes to put into practice a personal wallet for users to spend on social responsibility and to facilitate 'time-banking' instead of monetary support of projects. One of their campaign promoters was the NGO The Social Coin, which can be tracked in real time, allowing them to measure the positive impact of random acts of kindness in the world. Everyone who donates will receive 'a biodegradable coin contain[ing] a seed that can be planted at the end of the chain' that they in turn can share.⁴⁰

First Citizen Lawsuit Against Banks

How does activism tie into some of the more conceptual (artistic) endeavors at Goteo? One project is Tuderechoasaber (Your Right to Know), an online platform for creating and accessing requests for information from Spanish public bodies.⁴¹ At Goteo it is not about art for artists' sake; rather the emphasis lies on the sociality, incorporating activist practices and creativity into the platform in order to explore more 'radical approaches to alternative cultural economies'.⁴² Conceptual projects include 'CrowdfundPaRato' which is, according to the website, the first citizen lawsuit against banks.⁴³ The man

40. This project is deemed as one of the best social innovation crowdfunded projects by the EU commission. Goteo, 'The Social Coin', <https://goteo.org/project/the-social-coin?lang=en>.

41. Goteo, 'Tuderechoasaber', <https://goteo.org/project/tuderechoasaber.es?lang=en>.

42. Goteo has been awarded an ECF (European Cultural Foundation) hub grant and an 'Award of Distinction' in Digital Communities at Ars Electronica in Linz.

43. This campaign concerns the case of Rodrigo Rato who misrepresented Bankia at their IPO, promising growth and prosperity on 20 July 2011 with shares trading at €3.75. With the help of a PR campaign he was able to convince taxpayers to invest their savings, but then the shares collapsed to only €1 ten months later, and the gap grew. '#Crowdfundparato', <https://goteo.org/project/crowdfundparato/>.

in question, Mr. Rodrigo Rato, was bailed out and now taxpayers want to see justice served and their money back. With the charge of 'Impunity has come to an end!' citizens have decided to sue the bank through a crowdfunding campaign as a response to the Spanish Constitution, which in Article 119 states that those who do not have the means to litigate will have free judicial representation.⁴⁴ Because it seems that they did not trust that such an initiative would be supported by the state, they opted for alternative means, as there are not enough financial resources available.⁴⁵ The question lingers however, why are the lawyers, auditors, and researchers not working pro bono on such an ethical endeavor and why are citizens once again paying for the protection of their savings? The state could have supported free litigation already financed from taxpayers' money.



Monetization of Social Relations

In the past banks provided people with loans, or invested people's savings with a decent amount of interest instead of bestowing bonuses to bankers. With governments 'in cahoots' with the banks, most people are giving up on a foreseeable future with state support or regulation. The multinational companies are allowed to have off-shore entities which warrant a complete lack of oversight of their banking policies, in turn, these companies do not pay high taxes on profits made through the financial industry, speculation and off the books assets. The state never receives such monies because

44. They state: 'We will undertake criminal and civil actions against members of Bankia's Board of Directors, at the time when it was chaired by Mr. Rodrigo Rato and against the Board of Directors of the Financial and Savings Bank, for endorsing on the State a toxic and ruinous matrix. We demand prison and seizure of assets for a value equivalent to the amount obtained with the irregular placement of shares. 400,000 investors have been misled, many of them with savings in this bank. Seized money has now mysteriously disappeared, dragging the country to an imminent bailout', '#Crowdfundparato', <https://goteio.org/project/crowdfundparato/>.
45. Citizens needed to contribute a small amount (€15) each to reach the first goal (€15,000) in order to start the lawsuit. They needed to raise the amount in just 6 days, and instead they raised €18,359 in 24 hours. They admit to potentially needing more funding at later stages, for the cost of hiring independent auditors (€30,000-80,000) and an investigation of several months, perhaps years.

of 'loopholes' in regulation, allowing the companies to hire lawyers and auditors according to their agendas. Instead, the taxpayer is asked to support crowdfunding campaigns, whether they are for bailouts, civic projects, friends' creative endeavors, new technologies that enhance our lives, loans or equity.

Moreover an American report claims 'that if every American family gave one percent of their investable assets to crowdfunding, \$300 billion (a 10 times increase) would come into venture capital'.⁴⁶ Why should public services be paid privately with families donating 1 percent of their 'investable assets' or surplus when alternately all HFT (High Frequency Trading) could be taxed, whereby a small deduction from every transaction would lead to an exponential increase of (venture) capital that could be invested in the public sector?⁴⁷ In turn this cash flow could be allocated for judicial matters, such as prosecuting bankers and those responsible for the misuse of private funds instead of bailing them out with taxpayer money, or with crowdfunding initiatives.

Although many crowdfunding initiatives facilitate more socially engaged models for the common good and massive distribution in a collective dimension, this kind of platform capitalism is incorporating more private surplus from individuals because people are coerced to participate in them for a variety of reasons. For some, it is becoming an *ersatz* for governmental support, as 'crowdfunding is something like the anarchist's welfare state, providing in a solidary way. It's everyone providing money for each one [and] it's replacing the old idea of public services. So you have an invention here, and this invention could be really useful in the face of Abenomics and the programs [in order] to buy people's loyalties back.'⁴⁸ With technology enabling more nodes in the social media networks to interconnect, transmission between commons, communities, and communes is growing exponentially whether through monetary payments or in-kind exchanges. Seemingly, networks are what crowdfunding platforms wish to acquire, as the monetization of social relations becomes one of the most salient outcomes in regard to reward-based and civic crowdfunding.⁴⁹

By increasingly invigorating the sharing of users' interests within its own network, Goteo on the one hand contributes to the social benefit of projects for the common good, concomitantly it develops entrepreneurship through mobilizing the support of potential co-financiers with their micro-investments. 'With [the] facilitation of dialogue between project producers, local public administration and private micro-investors and mid-investors, as well as producing a set of open data stats regarding the projects and tendencies and backers' psychology and motivations, Goteo is trying to define [the] limits between open philanthropy and open investment'.⁵⁰ This actually

46. Ki Mae Heussner, 'Fred Wilson: What Crowdfunding Means for VC Business', *Gigaom*, 8 May 2012, <http://gigaom.com/2012/05/08/fred-wilson-what-crowdfunding-means-for-the-vc-business/>.

47. The financial transaction tax (EU FTT) has been postponed until 2016. Banks and the financial industry are debating on the Robin Hood tax, where a percent of every transaction is taxed.

48. Brian Holmes, 'Money Unlimited: The Consequences of Quantitative Easing', talk at MoneyLab conference, 22 March 2014, <http://vimeo.com/90207678>.

49. Renée Ridgway, 'Monetizing the Crowds', *Open! Platform for Art, Culture and the Public Domain*, 2 November 2013, <http://www.onlineopen.org/columns/monetizing-the-crowds>.

50. Felix Stadler, 'Crowdfunding the Commons: Goteo.org Interview', *Shareable*, 13 June 2012, <http://www.shareable.net/blog/crowdfunding-the-commons-goteoorg-interview>.

refers to the training of citizens about crowdfunding through workshops in order for them to learn how to participate in the production process.⁵¹ The open source code, called 'cloudfunding' is a public API delivered by forking in the online Github community. Easy to clone, the code can in turn facilitate other crowdfunding platforms. However this copycatting with copy left may eventually replace the public sector's responsibility of providing education, healthcare, welfare, infrastructure, transport and culture to its taxpaying citizens.

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51. 'The crowdfunding donations are a prerequisite, testing open projects for the subsequent search of micro-investments that may be the way to further fuel the emergence of this new world of business models and non-profit oriented real social purpose, rather than the model of a maximization of profit and perpetual growth regardless of the needs of society', 'Sobre la regulación del crowdfunding y Ley de Fomento de la Financiación Empresarial', <https://goteo.org/blog/4325>.

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THE MONEYLAB CROWDFUNDING TOOLKIT FOR CREATIVES

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The MoneyLab Crowdfunding Toolkit (MCT) helps creatives explore the opportunities and challenges of an increasingly popular form of alternative revenue. The Toolkit's aim is to better inform prospective crowdfunding campaigners on what the crowdfunding process entails before they start a campaign.

In its practical form, the toolkit is a website.¹ In what follows we briefly introduce the three main components of the Toolkit: several in-depth interviews with users, statistics based on a survey of creatives using crowdfunding, and an interactive graph of 60 Dutch and international crowdfunding websites. We conclude with some insights into future needs of the crowdfunding model.

Adding the Missing Voice

An important issue with the ongoing crowdfunding hype is that the voices of creative workers – the ones actually using crowdfunding platforms as a way to finance their projects – are missing from the debate. Therefore, the MoneyLab Crowdfunding Toolkit draws from eight interviews with practitioners experienced in crowdfunding and active in various creative sectors (performance and theater, music, filmmaking, social entrepreneurship, publishing, etc.) to identify the opportunities and challenges of crowdfunding from their perspectives. The interviews inquired into what motivated these professionals to crowdfund, what challenges and opportunities they identified, their relationship to the crowdfunding platform, to the funders, to their project, and whether they would do it again.

The interviews offer prospective campaigners a firsthand experience of what crowdfunding involves, both positive and negative. For instance, all interviewees stated that crowdfunding is more than just about raising money; it helps to build a community around a project, and it is an organized way to involve one's personal network. The process also makes the person or group who are crowdfunding feel more independent from traditional forms of finance. Yet the interviewees hinted that crowdfunding platforms at this moment do not suit people working in the arts and culture sector. This situation has to do with the business model used by the crowdfunding platforms, the

1. MoneyLab Crowdfunding Toolkit, www.networkcultures.org/moneylab-toolkit. The research and design for the MoneyLab Crowdfunding Toolkit was conducted and coordinated by the Institute of Network Cultures as part of the MoneyLab: Coining Alternatives project in 2013-2014. Credits for the visual design of the toolkit go to Gabriele Colombo.

amount of time and effort required to work on a crowdfunding campaign, and the reliance on friends and family for money. The widely held notion that crowdfunding helps you find an anonymous crowd actively participating and financially supporting your project is questionable.

What Does Crowdfunding Involve? Some Numbers

Second, the Toolkit addresses the lack of informational resources at hand for those who are planning to start a crowdfunding campaign. What do creatives need to know before deciding to crowdfund? The Toolkit discusses the statistics gained via a survey that asked creatives with crowdfunding experience about the challenges of the process.

Below are some of these graphs, showing statistics on the amount of hours people put into their campaign; how many funders they had; who they were (family and friends? acquaintances? strangers?); how they were reached (via social media, face to face, email, or formal meetings), as well as the average financial contribution received.

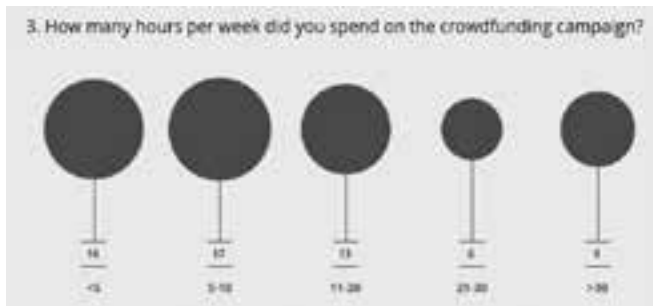


Fig. 1: Time invested in the crowdfunding campaign.

The upper figures represent number of hours invested. The lower figures represent the number of responses. The amount of time people invested in a campaign was on average between ten and fifteen hours a week, but a tenth of all respondents worked on their campaign over 30 hours a week.



Fig. 2: The main activities of the crowdfunding process and the time invested in them.

The figures in the circles represent the number of responses. Here it becomes obvious that most of the time of a campaign (almost half) is spent on promoting it. The majority of respondents did not have dedicated expertise in this field and instead needed to perform the task themselves.

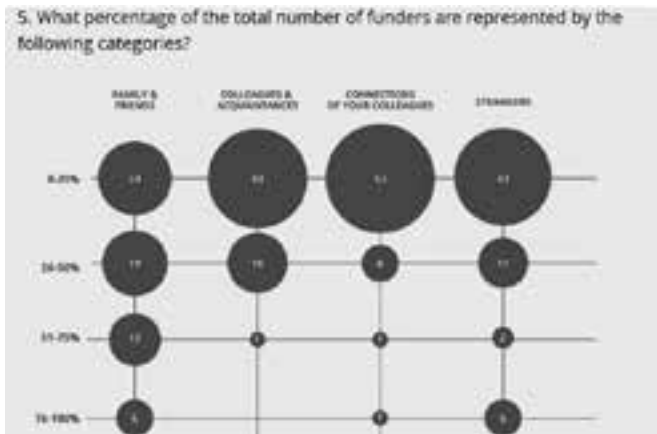


Fig. 3: Who funded the campaigns? The segmentation of funders according to their relation with the campaigner.

An interesting outcome was that we could see who the funders were. The majority of funders were close relatives. Thus the idea of an anonymous crowd helping with one's campaign seems to be questionable.



Fig. 4: Types of external help received or needed during the crowdfunding campaign.

Figures represent number of responses. The figures show 1/3 needed external help in their campaign, mainly on research on how to develop different aspects of the campaign.

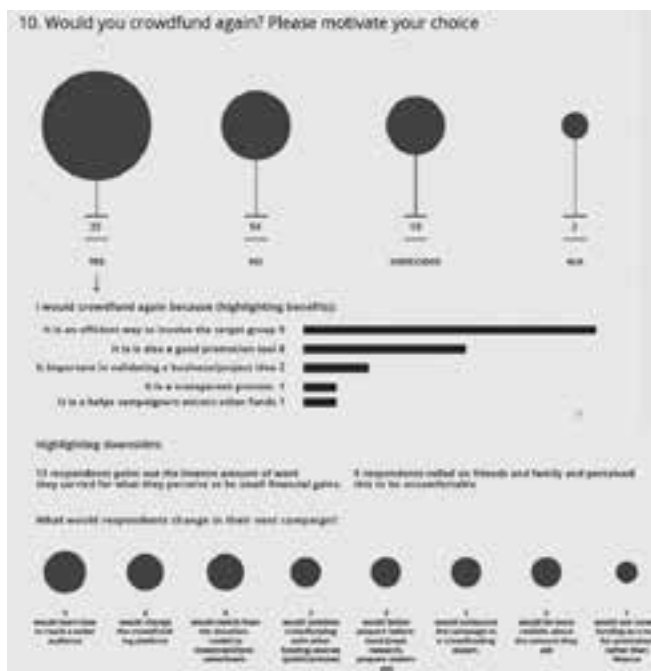


Fig. 5: 35 out of 60 respondents would crowdfund again. Figures represent numbers of responses.

Visualizing Crowdfunding Platforms

There are hundreds of crowdfunding platforms worldwide, and most offer very little insight into what happens behind their popular interfaces.² To tackle this issue the Toolkit's third feature is an interactive visualization that allows prospective campaigners to explore 60 Dutch and international crowdfunding platforms, as well as look into various in-depth statistics that have not been available before. The Toolkit is useful for projects that aim to raise less than 50,000 Euro; it draws from the Dutch context of crowdfunding and is therefore particularly useful for Dutch creatives.

The Toolkit allows filtering and sorting of the crowdfunding platforms, according to the following data:

- The total amount of money raised (by all successful campaigns).
- The type of projects they host.
- The crowdfunding model they use (donation / equity / loans / pre-order / subscription).

2. Each crowdfunding platform in the Toolkit was asked for the data. Some responded with figures, others declined to share the information, while others never replied. When data such as average donation and number of contributors was not provided by the platform itself, it was gathered from the fifteen most recent successful projects.

- The type of rewards that platforms allow (symbolic, product, shares, none).
- Whether they are suited for small (5,000 Euro<), medium (5,000-10,000 Euro) or large (>10,000 Euro) budget campaigns.
- The total amount of money raised (by all successful campaigns).
- The average financial contribution that a funder gives to a successful campaign.
- The average number of funders for a successful campaign.

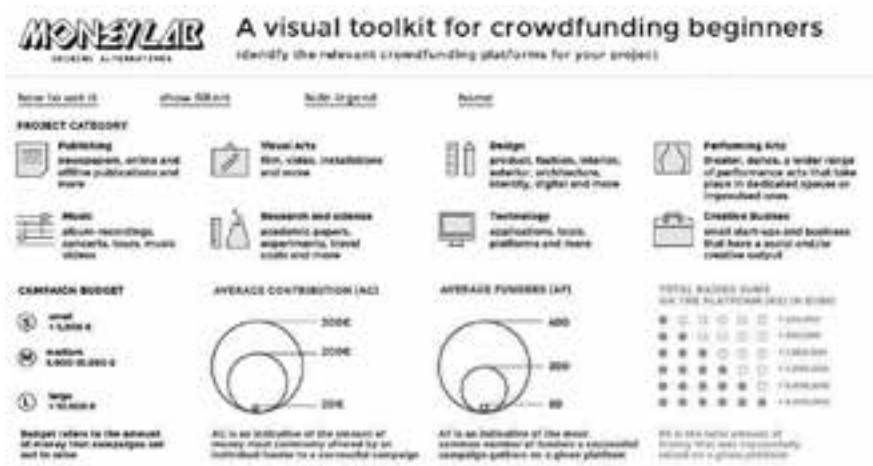


Fig. 7: The interactive visualization – the legend that explains the visual encodings.



Fig. 8: The Toolkit's filtering and sorting options.

In Closing: Critical Comments on the Future of Crowdfunding Platforms

Crowdfunding is commonly hailed as the new, democratic and transparent finance model for creative industries. However, crowdfunding is a business model, even when based on donations; once a campaign has started, all efforts are directed to marketing, outreach, and meeting the goal by any means. While seemingly making creative workers independent of or less dependent on traditional funding sources, crowdfunding platforms pin crowdfunders down to the business dynamics of the platform in question. Crowdfunding is perhaps even more complicated than traditional applications for

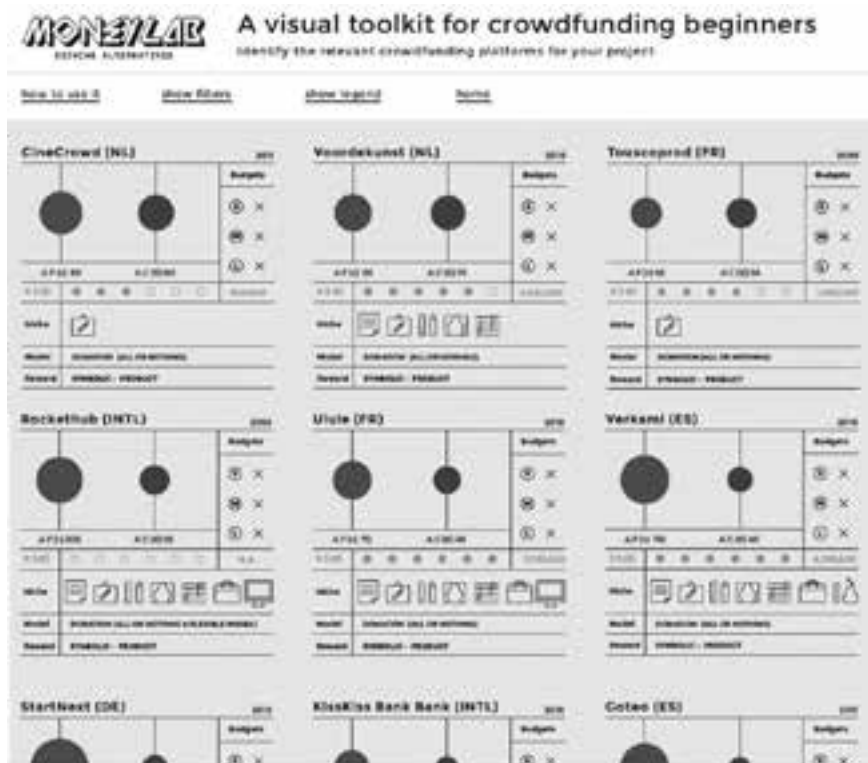


Fig. 9: The results displayed after opting for the filter and sorting options in Fig. 8.

funds or sponsorships; it comes with an extra baggage of time, free effort, multiple roles, and reliance on personal networks. But it also brings much added value, which explains why many people would try it again.

Also problematic, most crowdfunding websites hide particular types of information. For instance, the majority of crowdfunding campaigns fail,³ and these unsuccessful campaigns are rarely visible on crowdfunding platforms. Most of the browsing filters on crowdfunding platforms are designed to display only positive results and successful campaigns. Some crowdfunding platforms even have a policy of erasing unsuccessful campaigns or making them hard if not impossible to find on their websites. These design choices made it impossible to add 'success ratio' data to the Toolkit. This lack of transparency also causes misinformation, offering too much of an optimistic view of what crowdfunding can do. This design becomes problematic when the business model and design interface of big players such as Indiegogo.com are copy-pasted by most crowdfunding platforms, old or new; it perpetuates their faults.

3. Adrienne Jeffers, 'Indie No-Go: Only One in Ten Projects Gets Fully Funded on Kickstarter's Biggest Rival', *The Verge*, 7 August 2013, <http://www.theverge.com/2013/8/7/4594824/less-than-10-percent-of-projects-on-indiegogo-get-fully-funded>.

Making internal data public and existing public data easier to find is a first step to assist prospective campaigners and allow further research. Some crowdfunding platforms have already adopted this slightly different approach. SciFund Challenge, one of the very few crowdfunding platforms dedicated to research and science, updates regular statistics on average donation, funders, progress of campaigns, etc. Ulule, a French platform with international activity, does the same. Others take a step further and have adapted the platform to serve not only crowdfunding purposes but also crowdsourcing ones, such as Goteo. The next step is rethinking the standard design of platforms in order to better respond to the disparate needs of people using it. One standard interface and a suite of standardized services cannot provide an accurate response to these very different needs.

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- Kickstarter, <https://www.kickstarter.com/help/stats>.
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- MoneyLab Crowdfunding Toolkit, www.networkcultures.org/moneylab-toolkit.

APPENDICES

MONEYLAB CONFERENCE:

COINING ALTERNATIVES

MARCH 21-22, 2014 – LAB111, AMSTERDAM

FRIDAY, March 21, 2014

Session 1: Monetization of Everything

Moderators: Geert Lovink, Nathaniel Tkacz

Speakers: Saskia Sassen, Stefan and Ralph Heidenreich, Bill Maurer

Session 2: Dismantling Global Finance

Moderator: Nathaniel Tkacz

Speakers: Franco Berardi, Brett Scott, Tiziana Terranova, Brian Holmes

Session 3: Critical Art Practices

Moderator: Patricia de Vries

Speakers: Ron Peperkamp, Dadara, Dette Glashouwer

Session 4: Mobile Money

Moderator: Bill Maurer

Speakers: Erin Taylor, Taylor Nelms, Gawain Lynch

SATURDAY, March 22, 2014

Session 5: Bitcoin and Beyond

Moderators: Nathaniel Tkacz and Lana Swartz

Speakers: Eduard de Jong, Aaron Koenig, Beat Weber, Quinn DuPont

Session 6: Alternatives Bazaar On Stage

Speakers: Bitcoin ATM, Geheimagentur, Noppes, Peerby, Qoin, Kunst Reserve Bank, Share NL, The Next Nature Network, Timebank CC, Transition Towns Netherlands

Session 7: Critique of Crowdfunding

Moderator: Brett Scott

Speakers: Inge Ejbye Sørensen, Jamie King, Marijke Hoogenboom, Irina Enache and Robert van Boeschoten

Session 8: Designing Alternatives

Moderator: Rob van Hilten

Speakers: Max Haiven, Matthew Slater and Eli Gothill, Lana Swartz

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Franco “Bifo” Berardi is a writer, media theorist, and media activist. In 2012 he published *The Uprising*. As a coordinator of the European School for Social Imagination (SCEPSI), he has taught at Ashkal Alwan in Beirut, PEI-Macba in Barcelona, Accademia di Brera in Milano, and has lectured in social centers and universities worldwide.

Robert van Boeschoten is a philosopher interested in the cultural impact of media on society at large, and organizations in particular. His work is divided over the University of Applied Sciences Amsterdam (HvA) at the Communication and Multimedia Department and The University for Humanistics (UvH) in Utrecht.

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Paolo Cirio’s art projects investigate issues such as privacy, transparency, copyright, finance, and democracy. He renders his conceptual works through performances, photos, drawings, videos, and installations. His work has unsettled Facebook, Amazon, Google, and NATO, among others. He currently lives in New York City.

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Primavera De Filippi is a postdoctoral researcher at the CERSA / CNRS / Université Paris II (Panthéon-Assas). She is currently a research fellow at the Berkman Center for Internet & Society at Harvard Law School, where she is investigating the legal challenges of ‘governance-by-design’ in online distributed architectures, such as Bitcoin and Ethereum.

Eduard de Jong is an Amsterdam-based computer scientist, entrepreneur and inventor trying to improve security in software systems. He worked on software for smart-cards, later marketed as Java Card. De Jong started his career working at DigiCash, where he developed a passion for electronic money.

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Stephanie Rothenberg's artworks mix physical and virtual spaces to investigate new models of crowdsourced labor and the power dynamics between contemporary visions of utopian urbanization and real world economic, political, and environmental factors. She is Associate Professor at SUNY Buffalo.

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MONEYLAB

READER

AN INTERVENTION IN DIGITAL ECONOMY

EDITED BY

GEERT LOVINK, NATHANIEL TKACZ, PATRICIA DE VRIES

INC READER #10

MoneyLab is part of a global movement that demands the democratization of the design of our financial futures. Audacity is essential in times of crisis. And so we must engage constructively with hackers, entrepreneurs, and other creators who take up the call for economic alternatives. One first step is a map of the present: What works and what doesn't? What is worth pursuing and what must be left aside? Which histories bear on the present moment? And what are the limits of our economic imagination?

The *MoneyLab Reader* brings developments in crowdfunding, currency design, technologies of payment, and other economic experiments into dialogue. The authors of this volume discuss the implications of the current architecture of global finance, its impact on ever-growing income disparity, and question money and finance as such. It is not always clear, for instance, whether genuine alternatives are unfolding or if we are simply witnessing the creative extension of neoliberalism. At stake is the full spectrum of technologies of economic (re)distribution.

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