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A Route to Commons-Based Democratic Monies? Embedding the Governance of Money in Traditional Communal Institutions

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The financial crisis of 2008 resulted, among other, on a popular awareness that the monetary system was not working for the interest of the many. The blockchain technology that was launched soon after offered monetary activists and entrepreneurs a tool to re-imagine, re-claim and re-organize money along a vague ideal of a commons paradigm. A wave of monetary experimentation ensued that took a most concrete form in two entrepreneurial spaces: crypto-currencies with global ambitions and local currencies based on communal democracy. Seemingly distinct on the outset, both strands share a determination to develop a monetary system that serves the many. This has led participants on both sides to reach out toward each other. The article looks at one such attempt: the Sarafu community crypto-currencies in Kenya. These currencies are embedding the creation of money in traditional community savings groups. Using Eleanor Ostrom's framework and building on interview and ethnographic material, the article identifies the economic logic of mutualization proper of the savings groups as one that transforms private assets (one's savings) into a financial commons for the group. To build on this logic, the Sarafu model in-the-making is embedding the production and governance of the new community cryptocurrencies in these saving groups. In that doing, Sarafu has the potential to advance a new architecture of money. However, findings suggest that the standardization and automation of the new monetary rules through smart contracts impose neoliberal ideas that slipped into the code, risking the erosion of the very communal decision-making processes that made savings groups interesting anchors of a money commons in the first place.

Keywords: community currencies, blockchain, community institutions, commons, crypto-entrepreneurship

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INTRODUCTION

Money, and the search for profit for money's sake, is key to the workings of capitalism. While profit had been widely criticized before the financial collapse of 2008, only a handful of economists understood that the form money took shaped both the economy and society[1]. Money, that is, was invisible for the majority of the population; its design and form of creation taken-for-granted.

[1]Keynes' *General Theory,* Veblen's *Theory of Business Enterprise*, and Schumpeter's *A Treatise on Money*, are often presented for their lucid understanding of how money shapes and works in a capitalist economy. For insightful reviews, see Wray (2007); Lakomski-Laguerre (2016).

The insidious economic and social consequences of what has been called the Great Recession changed this naturalness of money (Lietaer et al., 2012)[2]. The concentration of wealth in "the one percent" in parallel to austerity policies, the increase of prices of financial assets parallel to a retrenchment of the welfare state resulted in a generalized realization that the monetary system was not serving the interests of the population as a whole. This has led to a revival in discussions of what money is, how it works, and how it could work (see, for instance, Ryan-Collins et al., 2011; Pettifor, 2017; Kelton, 2020). The financial crisis brought with it destruction of our economic and social fabrics (Tooze, 2018). It brought, too, the denaturalization of money.

In the wake of this denaturalization, we are seeing a wave of activists, citizens, entrepreneurs, practitioners, scholars and grassroots initiatives all around the world that want to change the way money works (Castells, 2017). Not contending the centrality of money for our economies, they do focus instead on the form money takes: How it is produced (and by whom), how it is distributed, and what incentives it is designed to create. From blockchain entrepreneurs redesigning payment infrastructures (Gloerich et al., 2018), to economists advocating for new monetary theory (Perelman, 2006; Earle et al., 2017; Pettifor, 2017), from grassroots initiatives introducing local currencies to promote sustainability (North, 2007; Seyfang and Longhurst, 2013), to bank money reformers crusading for sovereign forms of money (Dyson et al., 2016; Mellor, 2016), these monetary initiatives seem to agree on the need to change the monetary system. Indeed, for many of these activists, tech and social entrepreneurs, scholars and civic groups, it is not money, but rather the way money is designed and created that is the root of all evil. If we want to move toward more fair, egalitarian, human and holistic economies, then, they argue, money needs to be changed (Jackson and Dyson, 2012).

This wave of monetary experimentation takes a most concrete form in two entrepreneurial spaces. The first, crypto-entrepreneurs behind digital currencies with global ambitions (such as Bitcoin and Ethereum) are redesigning the technologies that they aim will underpin a new monetary system. The second, community organizers behind local currencies with geographically confined reach (such as Time Dollars, Regiogeld, or Transition Town currencies) are rethinking the way the production of money is to be embedded in community structures. Seemingly distinct on the outset—the first aim at global outreach, the later at local regeneration; the first are driven by tech-savvy engineers, the later by grassroots groups who, most often, have a less sophisticated command of technologies –, both global and local currencies are opening up our possibilities to re-imagine, re-organize, and re-claim money to put it at the service of an economic commons. It is this shared determination to develop a monetary system that serves the many that has led participants on both sides to reach out toward each other. This article looks at one such attempt. Current developments of the Kenyan community currencies build on the technological possibilities of cryptocurrencies to develop a monetary system that is embedded in the communities that are to use it.

The article is an effort to understand how the Kenyan community crypto-entrepreneur translates the logic of the commons into a new monetary system for networked local economies (Bollier and Conaty, 2015). It does so by looking closer into the current development of Sarafu, one of Kenya's community currencies. In its latest iteration, Sarafu is moving the production of money from a centralized social entrepreneur onto multiple, temporary, and acephalous local savings and loans groups, also known as *chamas*. In so doing, the production and distribution of money is being embedded in existing community institutions. Blockchain technology allows building the new monetary system on social relations different from those on which capitalist money rests and thus, I argue, is pivotal to the development of this form of commons-based money. However, the standardization and automation of the new monetary rules through smart contracts erodes the very communal decision-making processes that made *chamas* interesting anchors of a money commons in the first place. This raises questions on the various levels of coordination needed for a money commons. Further, in the process of designing a commons-based multi-currency system and coding its rules into smart contracts, orthodox economic assumptions slipped in, the use of the new monetary system now risking to perform an economic rationality that was originally foreign to the *chamas*. The article concludes that to develop truly democratic monies, new technology is not enough. Nor it is enough to embed these monies in plural community institutions. Both are necessary but insufficient components of a money commons. The final component, the article suggests, involves re-framing money along the economic logic characteristic of the *chamas.*

The article builds on ethnographic fieldwork in both rural Mombasa and urban Kisumu carried out during six 3 week-long field visits in 2017, 2018, and 2019. During those visits, 30 semi-structured group interviews with 26 *chamas* were conducted, as well as over 40 qualitative individual interviews with currency users and *chama* members ranging from 20 min to over 1.5 h. Since most *chamas* among vulnerable communities are female-only, over 80% of interviewees were women, aged between the early 20s and 60s. Further empirical material comes from two workshops with community groups in Kisumu as well from unstructured interviews with the crypto-entrepreneur designing and implementing Sarafu. More recent empirical material comes from many informal conversations held with the crypto-entrepreneur during the length of a research collaboration ongoing since early 2019. Finally, blogposts and the White Paper written by the crypto-entrepreneur have also served as the basis for analysis.

The following section lays out the analytical approach and conceptual tools adopted to study the Kenyan community cryptocurrencies. In outline, money is approached from the perspective of the rules governing its creation and circulation –, a perspective that opens up for an analysis of money as a commons and for an understanding of the different levels of governance of the money commons. Ostrom's distinction between resource units and resource system becomes central

[2]Given the depth of the economic crisis that ensued the financial break down of 2008, Robert Kuttner questions the commonly used term "the Great Recession" suggesting instead the designation "the Great Deflation" (Kuttner, 2013).

to the study of governance levels. The next two sections put the conceptual framework to work. The first analytical section describes how the communal institution of the *chama* governs circulation of monetary units in Kenyan communities, resulting in the commoning of national money for the benefit of *chama* members. What I call "*chama* logic" made such a non-hierarchical temporary community institution an interesting anchor to the cryptocurrency system in-the-making. That is the object of study of the second analytical section: Discern the locus of decisions concerning the governance of monetary units from those concerning the governance of the monetary system. Findings suggest that the need to code governance rules on the blockchain previous to the launch of the currency moves the center of decision from the *chama* to the crypto-entrepreneur. As this happens, not only may communal priorities be ignored; long-held unrealistic theoretical assumptions of human economic behavior (Crotty, 2013) are coded into the smart contracts. The article ends with a discussion of the implication of these findings for re-imagining a commons-based money.

GOVERNING MONEY

In the epilog of the entertaining, well-informed and beautifully written book *Money: The Unauthorized Biography*, Felix Martin (2014) reminds us that "All monetary history revolves around two fundamental questions: What are the rules governing the creation of money? And who gets to decide?" (p. 276). From the feudal kings and nobles issuing money to fund their wars to the bankers whose notes fueled the industrial revolution, money—its issuance and distribution, its costs and standard of value—has been coordinated by either the sovereign or the financiers. Those trusted to decide how much money to issue, the criteria of money creation, how to inject money into the economy or how to charge money use have, historically, alternated between the rulers of nations or provinces and the investors of global trade. And, as Martin and many others tell us (Graeber, 2011/2014; Desan, 2014), these money-makers do not always put the interest of the peoples first. The funding of wars, the pursuit of profit, or the expansion of colonies were often put ahead of the needs and priorities of common peoples. These, the peoples, rarely understood what money was, or, if they did, did not have the capacity to organize an alternative that challenged the established monetary actors. And so the governance of money continued undisturbed by the afflictions and vicissitudes of ordinary folks.

Until the financial crisis of 2008 hit the many, and the release of bitcoin in 2009 gave anarchists and activists a tool (Vigna and Casey, 2015). These two events ignited a conversation about the technicalities of money creation that went beyond the elite circles of economic experts to which it had thus far been constrained. The insights that money was created by private banks following a profit-motive, that such private banks' monies were made homogeneous and legitimate by a State accepting them in payment of taxes, and that money was thus in practice created "out of thin air," gradually extended among activists and scholars (Ryan-Collins et al., 2011; Benes and Kumhof, 2012; Werner, 2014; Kumhof and Jakab, 2016), and were eventually confirmed by key actors in the governance of today's monetary system such as the Bank of England (McLeay et al., 2014) or the IMF (Gross and Siebenbrunner, 2019). "The Great Monetary Settlement," as Martin (2014) frames the alliance between profit-seeking bankers and stability-seeking rulers first implemented through the creation of the Bank of England, set the stage for the growth of monetary society and the progress of capitalism (Ingham, 2008; Desan, 2014; Martin, 2014). It also put the profit-motive as the rule governing the creation of money: Bankers would extend credit, and thus increase the monetary supply, if they deemed the project profitable (Kumhof and Jakab, 2016). The market and its financial experts became cornerstones in determining the purpose and rhythm of money creation. While "the Great Monetary Settlement" stimulated the economic growth that has led to technological inventions and increases in quality of life for many, its underlying motive—profit –, also leads to inequality and bolsters booms and busts (Ingham, 1999). Inequality because banks extend credit to those they deem will be able to pay back or have enough collateral to act as guarantee of payment. That is, access to credit (or new money) is granted to those that are already creditworthy. Bolstering economic swings because bankers grant credit when they are optimistic about the economy and constrain debt creation when less optimistic; a pro-cyclical behavior that, among others, results in regular financial crisis and systemic instability (Benes and Kumhof, 2012; Gross and Siebenbrunner, 2019).

The larger issue, however, is not merely a matter of who governs money and how it is governed, of the market vs. the State, of private profit vs. public rule, or of a plutocracy vs. the people. Ultimately, it is a matter of the socio-economic system money itself contributes to create, of how money's form shapes social relations between economic agents, and of how the architecture of money strengthens certain regimes of authority to the detriment of others (Ingham, 2004). For money is no neutral instrument simply lubricating the market mechanism. As Desan (2017) aptly captures with her phrase "the constitutional approach to money," money's internal design, its very architecture, its "determinations selectively institutionalize certain relations, assign roles, and distribute profits" (p. 26). In other words, the way money is constituted constitutes the social and political system; the internal design of money co-designs socio-economic relations; or still, if you prefer, the structures for governing money also govern the communities in which that money is used.

Armed with an understanding of today's money creation process and an awareness of the workings of money on our socio-political system, crypto-entrepreneurs and grassroots innovators set to design a different monetary system. The first focused on doing away with financial institutions altogether (Nakamoto, 2008; Vigna and Casey, 2015; Swartz, 2017). The latter focused on anchoring the creation of money on values other than profit-maximization (North, 2018; Daskalaki et al., 2019). Regardless of their distinct focus, the discourse of both crypto-entrepreneurs and community activists reminds of Eleanor Ostrom's call for a more complex theory to understand, and design, the governance of common resources (Ostrom, 2010), a theory that acknowledges governance forms "beyond markets and states"

and that appreciates human drives beyond self-interest. In her many field studies, Ostrom observed community-based forms of governance where individuals cooperated in the management of the commons. She and her team have documented the many ways in which communities around the world design rules and sanctions, decision processes and governance institutions, adapted to the common resource they are set to manage. Similarly, today's crypto-entrepreneurs and currency activists are approaching money as a common resource that needs to be managed through institutions other than the State or the markets.

The analytical move is somewhat recent. Timid voices have started to conceptualize money and its underlying new technology as a commons (Meyer and Hudon, 2017, 2019; Rozas et al., 2018; Barinaga, 2019). Seen in this light, the main insight from the financial crisis of 2008 was that money is a common resource but that its management was privatized. Comparably to how the privatization of common land from mid-sixteenth century England led Marx to develop his theory of accumulation and class exploitation, the realization of the privatized nature of today's money governance is leading to much analytical development on the nature of money and on alternative modes of governing it (Wray, 2012; Fantacci, 2013). Money, this article argues, can be regarded as a commons to the extent that it is a "sufficiently large (resource system so) as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use" (Ostrom, 1990, p. 30). Anybody entering a national currency area can access the money used in that area through labor, rent, trade, or exchange[3]. It would be difficult (if not impossible) to, say, exclude a continental European from using the Sterling pound when entering the United Kingdom. Money can also be regarded as a commons to the extent that someone's use of a resource unit subtracts it from the pool of resource units other can access. The money I have in my bank account is for my use alone. This—Ostrom's—definition of a commons moves the emphasis away from property rights and onto the nature of the resource. In this line, money fulfills the two variables Ostrom identified as defining a common-pool resource: (1) difficult to exclude potential beneficiaries from accessing the resource system and (2) substractability of use of the resource units.

Continuing with this reasoning, another Ostrom distinction may help us shed some light on the relationship between the constitution of money (how money is created and governed, and by whom) on the one side and, on the other side, the shape of social relations and the economy at large. In her analysis of both natural and man-made common-pool resources, Ostrom distinguishes between resource system and resource units. While a resource system refers to "what *generates* a flow of resource units or benefits over time" (Hess and Ostrom, 2003, p. 121; italics added), resource units are "what individuals *appropriate* or use from resource systems" (Ostrom, 1990, p. 30; italics added). In natural commons, this distinction is easy to observe. Take a fishery. The resource system is the river, lake, or water basin whilst the resource units are the fishes living in that habitat. There is a direct relationship between the health of the resource system—the river, the water basin—and the flow of resource units—the number of fishes the system can sustain. Or, if you prefer, the rate of appropriation of resource units (how and how many fishes are fished) has an impact on the resource system (degree of biodiversity in the river).

Translating Ostrom's distinction to the money commons, the resource system would be the particular constitution of the monetary system and the resource units would be the coins in our pockets or the digits in our bank accounts. Note the instancing adjective "particular" in the previous sentence. Like other man-made common resources, money differs from fisheries or other natural commons in the fact that the resource system needs not only to be governed but it is also produced. Whereas rules and processes for appropriation of resource units need to be similarly decided in both natural and made commons, a man-made resource is a resource system that is constituted by a community and, as such, its architecture, its very internal design, is also a matter of governance. In other words, in a man-made commons such as money, the rules governing the flow and use of units as well as the rules constituting the resource system are the objects of decision. Monetary history clarifies how the form of the monetary system, its particular attributes, are, indeed, determined by those given the authority to design it (see, for instance, Kirshner, 2003; Martin, 2014; Desan, 2017). This insight, too, was one of the outcomes of the financial crisis of 2008. Money was denaturalized; the form of the monetary system laid open to a different "particular" design.

Herein, I argue, lies the productive strength of Ostrom's system-unit distinction. When we start looking at money as a commons that can be designed, a resource that is intentionally made and constituted to attend particular needs and priorities, then it is relevant to look at distinct levels of design. Or, to use the language of the regulatory regime recurrent in discussions of money and monetary policies, Ostrom's distinction can be helpful to understand the *level of intervention/coordination*—where community governance rules are made to stop and other actors, external to the community of users, are made to take over. In man-made commons, Martin's historical question "who gets to decide?" is thusly unfolded into two questions: "who gets to decide the rules governing the flow of monetary units?" and "who gets to decide the rules governing the monetary system?" These two questions are pivotal to understand the extent to which new monies in general, and the Kenyan community cryptocurrencies in particular, are anchored in the people that use them.

In sum, Ostrom taught us that the rules for governing the commons can be designed by communities to attend their particular needs, priorities, and features. She and her team taught us that communities successfully design governance institutions for the management of their commons. Crypto-entrepreneurs and grassroots currency innovators tell us that the same can be true for the management of money. Certainly,

[3]There are, of course, exceptions to the easy access foreigners (tourists, merchants, investors) have to a money that is not that of their country of residence. In countries like Cuba or Venezuela foreigners are restricted from using the currency used by nationals to cover everyday petty needs. But the exceptions only confirm the difficulties in excluding individuals from access to the money commons. My own experience traveling in Cuba testifies to the relative ease with which I, as a tourist, could simply exchange my foreign currency for the local peso with the guesthouse owner or in the streets.

the current wave of monetary innovation is experimenting with various ways of designing money and its governance institutions. Crypto-entrepreneurs have come with tech systems such as smart contracts and bonded curves to govern money; grassroots currency innovators do instead work with community-based organizational forms to govern local monies. These are two different strategies to governing money—reliance on the technology the first, on the community the second; coding standardizing rules in the blockchain *ex-ante* the first, adapting the rules as issues emerge *ex-post* the later (Rozas et al., 2018). When these two versions of governing money meet, like in the case of the Kenyan community crypto-currencies, how do their distinct approaches to governing money merge? What aspects of monetary design are left to the community of users and what to the external engineers coding the currency? In what sense is their new way of organizing money suggesting a route to a commons-based, democratic economy? And in what sense does their suggestion still retain some of the features of our current private-bank-made capitalist money? More to the point, what are the rules and who gets to decide?

A first necessary step to answering these questions is to understand the work of *chamas*—a communal institution particular to the Kenyan communities that the currency-entrepreneur is designing the novel monetary system for.

SAVINGS AND LOANS GROUPS (*CHAMAS*): A COMMUNAL INSTITUTION GOVERNING THE FLOW OF MONEY

It is 6.30 a.m. in the morning in rural Rohoni, a small farming and fishing village some 50 km north of Mombasa. A group of some 25 women all wearing a T-shirt in the same shiny blue with the words "Pamoja Mikono SILC group"[4] printed on the back sits on the ground under the shade of a big tree. At the center, a blue tin box. The group's treasurer collects one-by-one every members' weekly savings and gathers them in the box. Sitting closely by, another woman, the group's secretary, holds an accounting book in her lap and dutifully annotates the sums each woman hands to the treasurer. Members also return previous loans, with interests when due. Once all communal money has been collected, there is a round of loan requests. It can happen that the tin box contains enough capital to attend all petitions. Often enough there is not, and members have to negotiate how to prioritize the granting of loans. One's child may have had an accident and the mother is suddenly facing high hospital costs; another woman wants to re-stock her tiny grocery shop, the only one in the area selling much needed soap and wheat flour; a third woman has lost her job and, with it, the meager income she had and wants to hire a *boda boda* (a motorbike taxi) to buy some cooking fuel in the neighboring town for her to sell locally for a mark-up. Facing more financial needs than there are funds for, the group of women discusses the urgency of the many individual needs and the group's priorities. Some women agree to relinquish their loan requests for someone else's more pressing emergency. Under the conditions of scarcity they live in, assuaging one woman's urgency, however, may very well mean accentuating another woman's penuries the following week. Each loan decision is therefore potentially divisive and yet, the group of women has been meeting weekly for long and renewed their commitment every year.

Pamoja Mikono is one of hundreds of thousands of savings and loans groups in Kenya. You can see them in rural and urban areas; they are common among the most vulnerable groups and the more accommodated middle classes. The groups are defined by the territory—like the case in Rohoni described above and those connected to resident associations of urban informal settlements –, by family ties or occupational boundaries—like street vendor associations, waste-picker groups, or traders of a particular market. Or they can be set up purposely to coordinate a project—from funding the construction of an apartment building to bringing water pipes to the informal settlement. Scenes like the one in Rohoni take place in public parks and school yards, around the table of private living-rooms or in colorful plastic chairs by a public toilet.

Variously called SILC (Savings and Internal Loans) groups, SACCOs (SAvings and Credit COoperative), table-banks or, more generically, *chamas*[5], the basic structure of savings and loans groups is constant: members meet at a fixed regularity at a fixed time of the day to pool their savings together and loan the savings total to group members. Individual savings are carefully noted in a ledger or accounting book, and so are the loans taken, the amounts reimbursed and the interests paid. Groups form for a year with a starting individual contribution equal from all, which sum makes for the initial capital fund. The fund grows with the regular individual savings and the interests on loans. At the end of the year, savings and interests are distributed back to the individual that contributed them. Apart from the social ties and obligations binding the members, groups have well-developed sanctions for misbehavior—such as fines for not attending a meeting, coming without the group's identifying T-shirt, or chatting too much while at a meeting. These sanctions are noted in the ledger on a separate account and used to cover the costs of the end-of-the-year celebration. While there are many variations on this structure—the size of the group and the economic level of its members, the time period the group runs and the regularity at which it meets, the size of initial contributions and of individual regular savings, the maximum loan size, repayment schedules, and interest rates, the nature of sanctioning fines, whether savings and loans are in cash or mobile money[6], and whether the final

[4]Names of village, villagers and community groups mentioned in the article have been anonymized.

[5]Savings and loans groups receive a variety of names around the world—such as *stokvel* in South Africa, *chama* in Kenya, and *susu* in Ghana; *arisan* in Java, *swatow* in South China, and *ho* in Vietnam (Geertz, 1962). A large number of economists, sociologists, and anthropologists have studied this informal financial institution and found them in countries from Asia to Africa to Latin America. Diverse as they may be, they have, however, been found to share common situational conditions. For an excellent review (see Biggart, 2001). For a recent impact evaluation of these savings groups in Kenya (see Storchi and Rasulova, 2017).

[6]96% of households have a mobile money account in Kenya to pay for their daily expenses (see here). First introduced in 2007 as M-pesa by Safaricom, Kenya's largest telecom operator, other telecom operators have followed suit. It has been argued that mobile money has given access to financial services to the non-bankable as they can now easily transfer money to relatives and friends with

group's savings are to be redistributed to individuals or used as investment for a collective business –, the basic principle of the *chamas* remains the same: pooling individual savings and giving group members access to the mutualized capital fund.

The *chama* economic logic is defined by the social practices of mutualization that constitute the very group. Pooling together individual savings and distributing them to work for the benefit of individual members, *chamas* play a central role in a process of commoning (Gibson-Graham et al., 2006) privately held national money. Instead of keeping one's savings in one's home or phone account where they are of no use to the community, *chamas*' contribution practices pull money out of mattresses and phones and into the communal tin box (or phone card or bank account). Through the obligation of a regular individual contribution to the group, through rules on minimum size of that contribution, and through sanctions for failing to attend a meeting thus neglecting to contribute, *chamas* both commonalize money and keep it in the community. In Ostrom's terms, the governance contribution rules that constitute the *chamas* are rules that mutualize money. These are rules that shape how many resource units there are for the group to use.

Then there are appropriation rules, those regulating the individual use of the monetary units thus mutualized. These rules concern loan granting, repayment schedules and interest on loans. Typically, appropriation rules are related to the size of an individual's accumulated contribution to the common pool. For instance, the maximum loan size a member is granted from the group's mutualized savings hinges on how much the particular member has contributed to the *chama* thus far—a common limit being twice the total savings the individual loan-taker has put into the group's fund. That is, if a member has saved 3,000 KSh, she can receive a loan of up to 6,000 KSh. Or take repayment rules, which vary with the size of the loan. Staying with Rohoni's *Pamoja Mikono chama*, for loans of up to 3,000 KSh, repayment had to be done within 1 month; for loans between 4,000 and 10,000 KSh, repayment was due within 2 months; for loans between 11,000 and 20,000, repayment time was 3 months. Prescribing the allocation size of the mutualized money and stipulating the speed of repayment, appropriation rules make sure that "money is not idle for long but changes hands rapidly, satisfying both consumption and production needs" (Bouman, 1983). In other words, the detailed appropriation regulations of the *chamas* shape how monetary units flow and circulate within the community, making sure that money reaches all members.

Contribution and appropriation rules set the tone of the *chamas* economic logic, one that builds a capital commons through practices of pooling and that guides the flow of resources to the benefit of community members through practices of loan allocation. The economic logic of the *chamas* is one of mutualization and circulation, of commoning and distribution within the boundaries of the *chama*. Of pulling money into the group and pushing it out to its members. This logic is well illustrated by the unconventional understanding of interest visible when groups distribute earnings at the end of the year. Instead of the dominant approach to interest as payment for the risk incurred by the lender (normal in bank loans), these groups see interest payments as contributions the borrower makes to the group's pooled savings. At the end of the year, individuals are given back a lump sum made of her annual regular contributions and a percentage of the interests she paid to the group for the loans she took. At *Pamoja Mikono chama*, 50% of an individual's interest payments were paid back to her. The other 50% was distributed evenly among those group members that had taken loans throughout the year. Because members failing to borrow from the common pool are perceived as not contributing to the pool in the form of interests paid, these members receive no dividends at the end of the accounting year even though their savings were also pooled into the fund for the granting of loans. It is a distinctive ethics of interest, one that centers not around the individual risk of the lender, but around the borrower's contribution to the commons. Members' relationships to the *chama*, that is, are framed as provision to a commons, their financial commons, from which all members benefit in the form of access to financial services that are un-reachable for them through the regular banking system. To Martin's first question—What are the rules governing money?—*chamas* answer with mutualization and circulation rules.

Chamas "answer to the second question—Who gets to decide?—and implicitly, I would add, to the question 'on what basis are decisions taken?" is also distinctive. Each loan decision involves a delicate balance between individual economic needs, community relations and situational knowledge. When granting loans, prioritizing someone's hospital costs may mean somebody else's needs won't be covered this time, or a community need for, say, fuel will have to wait for a while. Tightly intertwined with financial considerations are matters of communal life, of neighborly relations, of social and financial security. Each decision involves a mix of personal and impersonal concerns that need to be weighed against past group decisions and anticipated community needs. It is the group who decides the rules, indeed. These rules are however not based on profit-maximization. Rather, decisions are based on a mix of financial and social concerns, of impersonal and personal relations, of obligation and trust, and are continuously re-considered in relation to the changing circumstances of community life.

The *chama* logic of mutualization and circulation, that is, is not an approach that merely centers on finance, one exclusively focused on impersonal relations of economic obligations and rights. Governing personal and group relations is just as crucial. *Pamoja Mikono chama*'s management of group relations when these founder illustrates the point. The temptation for the treasurer to take the tin-box with the collected savings and fines and flee is always present. And while such sort of misdeeds are rare (see Geertz, 1962; Burman and Lembete, 1995), they do occur from time to time. One interviewee recounted the occasion when the tin-box disappeared with 500,000 KSh of group savings in it—a large sum for poor female farmers in rural Kenya. The treasurer argued the box had disappeared while she was away from her home. Resolved to find the culprit, the group altogether went to a nearby sacred forest and prayed for the wrongdoer to get sick and die. "Nobody has died yet," the interviewee explained. The *chama*

a simple sms and even access micro-credits through their pre-paid phone card (Hughes and Lonie, 2007).

also denounced the treasurer to the police and expelled her from the group. Personal and financial relations broke down. In such situations, when relations within the group collapse, conjuring the spirits offers a procedure to rebuild personal connections. No death overcoming, this practice opens up the possibility for the suspect to regain the trust of the other group members and eventually return to the *chama*. For as much as the individual finds financial and social security in the group, the group builds its financial and political strength in the sum of its members. Such is the economic logic of mutualization, one that is conditioned to the tight weaving together of impersonal financial relations with personal knowledge and intimate trust.

It can be argued that mutualization rules, social practices and cultural beliefs not only govern financial obligations and enable the coexistence of impersonal and intimate relations within the group; they also contribute to build trust in *chamas* as financial institutional arrangements for the community (Malkamaki, 2015). In this doing, *chamas* become structures the community has instituted for transforming private assets (one's savings) into community assets (the group's fund); that is, into a financial commons for the group. The strength of this mutualization logic for building savings and anchoring a community's economic life has long been recognized by scholars (see Geertz, 1962) and development agencies (Boonyabancha, 2001) who build their micro-lending programs, such as those promoted by Yunus and his Grameen Bank, on these community institutions (Biggart, 2001; Yunus, 2003). Important as their financial function for the community is, it is the particular, integrative, communal economic logic they spring from—a logic of mutualization and circulation, of developing a commons for the benefit of all members, and of weaving together financial and social obligations—that, in Kenya, captured the attention of the community crypto-entrepreneur. As he set to develop a monetary system for the many, one that "give[s] people the same power as banks[7]," *chamas* became the institution on which to decentralize matters of governance and decision-making concerning the creation and circulation of the new money. The next section looks into the extent to which the monetary system in-the-making borrows from the *chama* logic to answer the twin questions of this article—"what rules" and "who decides."

THE SARAFU COMMUNITY CRYPTOCURRENCIES: SOMETHING NEW, SOMETHING BORROWED, SOMETHING OLD

Sarafu is the generic term of the Kenyan community cryptocurrencies, regardless of whether they are used by dwellers in urban informal settlements in Nairobi or by villagers of rural Mombasa. While at the moment of writing, all communities use one single cryptocurrency—Sarafu –, work is ongoing to, in the near future, enable each community to create its own cryptocurrency. A second trait is key to the monetary system in-the-making: The possibility to trade across community cryptocurrencies. For this, Sarafu will turn into the system's reserve currency, which—and this is a third defining trait –, will serve as the basis for the automatic calculation of exchange rates across community cryptocurrencies. These three traits—one, a multiplicity of community-created cryptocurrencies; two, capability to trade directly between distinct currencies; and three, automatic determination of currency prices—are central to the crypto-entrepreneur's vision of the new monetary system becoming a "public infrastructure"[8] that "anyone in the world can use,"[9] an "infrastructure to enable a decentralized financial system without [. . .] giving [away] undue power over such core aspects of our lives[10]." The Sarafu system in-the-making is resolutely founded both on the dreams of futurism, decentralization and automation that characterize radical blockchain projects (Swartz, 2017) and on grassroots currency innovators' ambition to democratize money (Bollier and Conaty, 2015).

A defining design component of any monetary system is what the basis for deciding the money supply is, or, phrased differently, what grants trust in the value of the monetary units created. The funding needs of wars often decided how much the sovereign minted, trust on the money based on the ruler's power to accrue taxes (Goodhart, 1998). The desire for profits weighs in the overall credit issuance of today's bankers, trust being placed on the network of relations among banks, judicial institutions, and tax collecting agencies (Pettifor, 2017). In the Sarafu system in-the-making, a *chama*'s capacity to mutualize individual savings decides how many monetary units to issue. The collective savings in conventional money become the reserve of the community cryptocurrency, which is translated one-to-one to reserve in Sarafu. This reserve is then leveraged one to four. That is, a reserve ratio is coded into a smart contract so that for every Kenyan shilling the *chama* puts apart, four units of community currency are created. The Sarafu system thus moves trust from the sovereign and financial banking networks to the mutualized savings of the *chama* and the automation of the code.

Once the supply of community currency has been created and airdropped into the *chama*'s communal phone, the *chama* plays a similar role in its new monetary commons as it does in relation to its undertakings with conventional money: It distributes the currency to its members through the granting of loans. Appropriation rules regulating loan sizes and repayment schedules similarly ensure the flow of monetary units reaches all members.

The final component of the Sarafu monetary system is the hierarchy of reserves paired with the automated determination of exchange rates. The purpose is to facilitate exchange across community cryptocurrencies. A central ambition of the Sarafu crypto-entrepreneur and of the developers contributing to its code is to create "a global [. . .] network of connected currencies[11]," a monetary system that fulfills the needs of inter-community trade. The system designed builds on reserves each *chama* currency holds in Sarafu, which relate one-to-one to

[7] Video post "How to give people the same power as banks," here.

[8] Over a phone conversation in April 7, 2020.

[9] Blogpost on April 18, 2020. See here.

[10] Blogpost on March 21, 2020. See here.

[11] Blogpost on March 21, 2020. See here.

the *chama*'s savings in national currency. *Chama* currencies are connected to each other through reserves each keep in Sarafu. When a user of a currency buys from a user of another currency, the Sarafu reserves in her currency move to those of the selling community currency. In this way, the community currency of the buyer weakens relative to the community currency of the seller. This is reflected on the currency's exchange rate and is automatically calculated by a "bonding curve." In other words, bonding curves—algorithms coded in a smart contract—regulate the price of a currency based on how many Sarafu reserves a community of users has in their currency system. A difficult concept to explain to monetary novices, such as the communities he worked with, the Sarafu entrepreneur uses the connected water glasses metaphor to clarify the idea: "It's like water glasses connected to each other. When the level of water in one goes up, the level in the other goes down. The same with the price of these currencies against each other. When many buy from a community, the level of reserves [relative to supply] of its currency goes up against the other[12]." Variable exchange rates, it is hoped, will attract individual users to buy from those communities which currencies have seen its price go down, thus pushing the currency's exchange rate back to a level that equates the prices of products across communities. As the community crypto-entrepreneur puts it, "the system is based in this idea that markets keep prices fixed at a certain level[13]." Or, as formulated in the White Paper, "[f]ree competition among [community cryptocurrencies] can be seen as the fruition of Hayek's (1990) proposal for competitively issued private currencies" (Ruddick, 2020, p.5).

In short, the Sarafu in-the-making is founded on the possibility of decentralization and automation brought by the new technologies to develop a decentralized multi-currency space with automatic calculation of exchange rates. Further, it borrows the economic logic of *chamas* to anchor the issuance of the currencies on the *chamas*' mutualized savings. Finally, it builds on an old idea of a market of competing private currencies, with freely moving exchange rates. How does this combination of novel automation, borrowed community logic and old free-market ideals shape the rules governing the money commons? And where does it place the center of decision-making?

Money Governance in the Sarafu System

Let us examine the extent to which Sarafu transfers the governance of money from States and markets onto communities. For that, let me linger in the relationship between the *chama* and the new money. Ostrom's system-unit distinction is instructive here, a distinction that, as we saw, unfolded Martin's second question into two questions: "who gets to decide the rules governing the flow of monetary units?" and "who gets to decide the rules governing the monetary system?" As for the first, the *chama*'s relation to the flow of monetary units remains unchanged regardless of it being conventional or community money. Indeed, community groups, following their own decision procedures regarding level of savings and granting of loans, maintain the contribution and appropriation rules they apply to the national Kenyan shillings also in regards to the community cryptocurrency. *Chamas*, that is, continue working along an economic logic of mutualization and circulation that keep the currency units circulating.

It is however in the *chama*'s relation to Ostrom's second element, the monetary system, that we see the productive potential of the blockchain as it is here that the *chama* acquires a new role, a role reminiscent of a central bank. *Chamas*' pooled savings in Kenyan shillings constitute the reserves of their new community cryptocurrency. Once savings have been set aside, smart contracts on the blockchain automate the leverage of group savings—all communities are automatically granted a 1–4 reserve ratio on their savings—and enable the standardization of the reserve ratio rule to all cryptocurrencies created in the Sarafu system. Finally, another smart contract (a so-called "bonded curve") automates the calculation of exchange rates across the various Sarafu cryptocurrencies. Standardization of reserve ratios and automatization of determination of exchange rates facilitates the crypto-entrepreneur's work of scaling up the Sarafu monetary system.

While automation and standardization are pivotal to a speedy deployment of "a global network of connected currencies," they come at the cost of a regression in the understanding of money coded onto the blockchain and, with it, the erosion of the democratic ideal that *chamas* embody. The Sarafu monetary system in-the-making follows the fractional reserve banking model, in which money is implicitly understood as valuable in itself. Monetary metallism attributes value to the material stuff bills and coins are either made of (in the case of feudal silver coins) or are supposed to be a representation of (as with the notes backed by gold held in banker's vaults during the gold standard periods). When value is seen in the material stuff behind money, the logical conclusion is the need to (fully or partially) back the money supply with collateral—be it gold, reserves in foreign currencies or, as in Sarafu, the savings—in shillings—of the *chamas*. The credit notion of money common among grassroots currency innovators (for some examples, see Croall, 1997; Cahn, 2004; Greco, 2009; Slater and Jenkin, 2016) and that characterized earlier, paper-based versions of the Kenyan community currencies (Barinaga et al., 2019) has inadvertently mutated and a metallist understanding of money has slipped in. With it, the locus of trust has moved from the rules and sanctions that constitute the *chama* onto the immobilized savings that make up the reserves. And with it, the site where decisions are made has moved from the *chama* to the code (and its coder) that automates the relationship between reserves, money supply, and exchange rates.

Germane to the "who decides" question, automatic reserve ratios push the democratic ideal back. One, because seeing value in the collateral moves the issuance decision from the community that is to use the currency onto the savings which it is able to gather. Instead of delicate considerations that balance financial and social obligations within the community, the decision of how

[12]Fieldnotes from June 2019, corroborated in an email exchange on August 23, 2019.

[13]Fieldnotes from November 21, 2019.

much money to issue is guided by the community's capacity to save, not by its trading needs. For communities living under the poverty line, often leading a hand-to-mouth existence, anchoring issuance in savings amounts to immobilizing much needed mutualized savings, savings that previously rotated among members through the loan granting rules of the *chamas*. To overcome such limitation, the Sarafu crypto-entrepreneur collaborates with the Red Cross, which donation is funneled into the system's reserves (Bornstein, 2019). While channeling donations through reserves against which *chamas* are allowed to redeem their Sarafu savings is an improvement of extant cash transfer programs[14], it, however, effectively hands the issuance decision over to external actors. Two, democracy is pushed back because it is the engineers, the crypto-entrepreneur, the tech-savvy, that think the algorithm, decide reserve ratios, and code it into the smart contract.

Automation does more than erode communal decision-making processes. Automated determination of exchange rates, the "automatic market maker" with its underlying Hayekian ideal of a market of currencies, potentially introduces speculative behavior into community relations. The crypto-entrepreneur codes on the assumption that buyers will procure products from those communities which currency exchange rate is lower in reference to one's community currency. The engineer-cum-economist, that is, develops the algorithm on the assumption that individuals take their buying decisions based on prices alone, on a search for profit-maximization. The social obligations and personal relations that we saw so shaped the *chama*'s decision-making processes disappear in the coder's concerns and *homo economicus* gets encoded in the algorithm, slipping in a political doctrine with dangerous ideological components (Cramer, 2002; Read, 2009; King, 2012; Crotty, 2013). Intent to promote the profit-seeking behavior of the rational economic man premised for the stabilization of exchange rates in the Sarafu system, communication of exchange rates is pushed onto traders through brief text-messages to their phone, a continuous reminder to the currency user that there is a better individual business to be made when buying from or selling to members of a different community. A behavior that was assumed and coded, is being encouraged, to observable effects. During a field visit in November 2019, Yazid, a rural villager, explained how he consulted exchange rates to decide when to redeem his Sarafu savings to Kenyan shillings. Yazid had taught Zalika and Lakeisha, two women in the same village, who in June did not know of exchange rates and had now started to make certain decisions based on them. The behavior of the theoretical *homo economicus* that was first introduced through the algorithm ends up provoking real individual economic behavior, a reminder of the performativity of economic models (MacKenzie, 2006; Callon, 2007; Muniesa, 2014).

Swiftly, one of the most energizing novelties of the community cryptocurrencies being developed in Kenya is embedding the monetary system in the traditional community institution of the *chama*. Its promise lies in the role it plays in the mutualization (or commoning) of money, in its communal decision-making processes, and in its balance between social and financial obligations in all matters of economic life. To this borrowed monetary component, however, and through the automation enabled by novel blockchain technology, an old understanding of money as thing as well as a revered and individualized notion of economic rationality is imposed onto the community. Whilst the consequences on the social fabric of the community are yet to be seen, the fear is that encoding such economic and monetary theories end up realizing what was initially only a theory. The result: The undermining of community decision processes, the engendering of speculative behavior, and the favoring of economic value and financial gain over social obligation and personal relations.

CONCLUSION: DEMOCRATIC OR DESPOTIC MONEY?

The monetary awakening induced by the financial collapse of 2008 resulted in increasingly loud calls for a money that serves the interests of the many and that is subject to the continuous revisions and active negotiations of slow, but inclusive, democratic processes (Mellor, 2016). Calls for monetary democracy got an empowering tool with the launch of bitcoin in 2009 (Swartz, 2017). Bitcoin's underlying technology—the blockchain—and the technological developments that followed—such as smart contracts that automate the application of rules—gave these calls a cheap, yet potentially powerful instrument to realize their dreams. The possibility to design, and implement, a commons-based money was intoxicating and a number of grassroots and crypto-entrepreneurs started experimenting with various forms of money, playing with the rules determining the creation, distribution, and use of these new monies[15]. Sometimes driven by anarchist ideals, other times driven by a community ethos, these monetary experiments share the urge to re-claim money. How can the power to govern money be handed over to the people? The article looks at one such experiment, the Sarafu community cryptocurrencies being developed in Kenya, and considers its particular answer to that question: *Chamas*—a traditional institution governing communal economic and social life in many countries around the world—and its logic of mutualization and circulation can be the

[14] In recent years, cash transfers programs have increasingly attracted the attention of development agencies. Using mobile payment technologies, these programs transfer funding, unconditionally, directly into beneficiaries' mobile phones. A limitation of such programs is that, as beneficiaries use the money to buy from outside the community, the cash transferred quickly leaves the community it is meant to help develop. In collaborating with Sarafu, the Red Cross aims to make development money work for the community for a longer period of time. Putting donation funds in the reserves of the Sarafu system leverages them 1–4 to the community cryptocurrency. In that form, it can solely circulate within the community and only exits the community once groups redeem their Sarafu savings for the national currency that make up the reserves. For an elaboration of how tying cash transfer programs to the Kenyan community currencies work, see Bornstein (2019).

[15] For a few examples, see FairCoin, Holochain, Ethereum, PeerCoin, or PAR.

pillars of a decentralized monetary system for networked community economies.

The article analyzes the implementation of that answer, with a special focus on examining the locus of governance and decision-making in the Sarafu monetary system. To do this, the article's first analytical move—and its first contribution—is to conceive money itself as a commons and to build on Ostrom's distinction between resource units and resource system in common-pool resources. The distinction allows us to unfold the question on the governance of the money commons into two questions: (1) who gets to decide the rules governing the flow of monetary units? and (2) who gets to decide the rules governing the monetary system?

Operationalized through the dual analytical question, Ostrom's distinction helped observe that in the Sarafu design of money *chamas* are certainly given a pivotal role in decisions concerning the flow of monetary units, yet they are sidestepped in regards the design of the monetary system. Anchoring the governance of the flow of money in the *chamas* is relatively direct and easy to implement; they simply have to run with Sarafu as they already do with the national money. In regards governance of the monetary system, however, the mutualizing logic of the *chamas* lost its ground to a systemic solution based on the logic of the market. The neoliberal ideals of the *homo economicus,* the self-regulating price mechanism, and the orthodox notion of money as representation of hard value slipped into the code. Monetary designs, that is, are not without ideological valences (Goodhart, 1998; Crotty, 2013; Desan, 2014). Now encroached into the code, those ideological composites are forced onto all communities implementing the Sarafu monetary model, with visible performative effects. The article's second contribution is thus to the anthropology of money. Ethnographic observation suggested the introduction of *homo economicus* ideals through the monetary technology fostered new speculative profit-maximizing behaviors among community members[16].

The third and last contribution of this article is to highlight the contradiction between the democratic ideals common among many activist crypto-entrepreneurs (see Swartz, 2017) and the practical needs of coding a digital infrastructure. The need to code the governance rules of the monetary system *previous* to its implementation moves the center of decision-making from the *chama* onto the crypto-entrepreneur. Such erosion of community-based decision-making has to do with the entrepreneur's global ambitions. Building a "public infrastructure" that "anyone in the world can use" necessarily requires finding a standardized solution that enables communities to trade among them. A common monetary language is needed, if you want, one that calculates the prices of currencies—the exchange rates—on the same parameters of value. In the engineering world of code, standardized rules translate into algorithms programmed *ex-ante* (Rozas et al., 2018), before communities are even given the opportunity to articulate their priorities and idiosyncrasies. And so, governing money with algorithmic formulas deprives the *chama* of the power to govern important aspects of the money they use. While the crypto promise of autopilot money governance—through algorithms and smart contracts—is alluring, it detracts money of the flexibility needed to adapt it to local social and economic changing circumstances. Governance through despotic algorithms may increase the efficiency of currency markets and may speed the scaling up of the new system. But this may be at the cost of eroding communal democracy and eliminating an entire mode of thinking about social coordination (on this, see also Morozov, 2019).

The story told in this article is, as it were, a contemporary version of "putting old wine into new bottles." It is not enough to adopt ingenious and innovative blockchain technology. It is neither enough to involve communal institutions into making certain decisions. Above all, we need to move away from an orthodox, damaging and long-challenged, yet dominant science of economics that understands money as neutral, sees money's value in the hard thing it represents, conceives humans as selfish profit-maximizers, and worships the self-regulating price mechanism. If we are serious about building democratic monies, we urgently need a "new meme for money" (Wray, 2012). In the spirit of Eleanor Ostrom, this article is written from the belief that communities hold the key to such a re-framing of money. *Chamas* do indeed show us an economic logic that is far from the texts taught in traditional university courses in economics. They show that there are economic rationalities that balance financial, social and communal concerns. They show us that individuals are conditional cooperators (Ostrom, 2000) and that communal democracy can be a stable ground for decision-making processes. Reaching out to *chamas* is, certainly, the most provocative innovation of the Sarafu money. Yet, in discussing the governance of money, the locus of monetary decision-making, we need to go beyond simple translations of those community institutions and seriously consider what active role *chamas* could play in both determining the flow of monetary units and, most importantly, in deciding the particular constitution of the monetary system. Ostrom's unit-system distinction may come handy here as it can help us identify different levels of monetary coordination. In so doing, Ostrom's conceptual tools can help us better design institutions for the democratic governance of these new money commons.

[16]Such are the neoliberal economics encoded in crypto-currency projects that some observers have started to argue that blockchain technologies are being introduced to intently advance the neoliberal agenda in the Global South. They call these efforts a "new form of crypto-colonialism" (see Crandall, 2019; Howson, 2020).

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because No personal contact information is to be shared outside the research team. All other data, concerning transactions (without identifying those involved in the transaction) is openly available. Requests to access the datasets should be

directed to http://cic-dashboard-frontend-webpage.s3-website.eu-central-1.amazonaws.com/.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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REFERENCES

Barinaga, E. (2019). "Transforming or reproducing an unequal economy? Solidarity and Inequality in a community currency," in *International Journal of Community Currencies Research*, (Brazil: IJCCR).

Barinaga, E., José, M., and Campos, M. J. Z. (2019). "Malleable grassroots infrastructures: The case of the Kenyan community currencies," in *5th Biennial RAMICS (Research Association on Monetary Innovation and Community and Complementary Currency Systems)*, (Japan: International Conference).

Benes, J., and Kumhof, M. (2012). "The Chicago Plan Revisited," in *IMF Working Paper*, (Washington, D.C: International Monetary Fund.).

Biggart, N. W. (2001). Banking on each other: The situational logic of rotating savings and credit associations. *Adv. Qual. Organiz. Res.* 3, 129–153. doi: 10.12816/0029045

Bollier, D., and Conaty, P. (2015). *Democratic money and capital for the commons. Strategies for transforming neoliberal finance through commons-based alternatives*. Berlin: Heinrich Böll Foundation.

Boonyabancha, S. (2001). Savings and loans; drawing lessons from some experiences in Asia. *Environ. Urbaniz.* 13, 9–21. doi: 10.1177/095624780101300202

Bornstein, A. (2019). *Community Inclusion Currencies: Lasting Solutions with Early Action and Resilience Financing*. Washington D.C: American University.

Bouman, F. J. A. (1983). "Indigenous savings and credit societies in the developing world," in *Rural Financial Markets in the DevelopingWorld*, eds Von Pischke, Adams, and Donald (Washington, D.C: World Bank).

Burman, S., and Lembete, N. (1995). "Building new realities: Women and ROSCAS in urban South Africa," in *Money-Go-Rounds: The importance of rotating savings and credit associations for women*, eds S. Ardener and S. Burman (Washington, D.C: Berg).

Cahn, E. (2004). *No More Throw-away People: The Co-production Imperative*. United States: Essential Books.

Callon, M. (2007). *What does it mean to say that economics is performative? In McKenzie et al. (eds.) Do Economists Make Markets*. New Jersey, NY: Princeton University Press.

Castells, M. (2017). *Another economy is possible: Culture and economy in a time of crisis*. Cambridge: Polity Press.

Cramer, C. (2002). *Homo Economicus* Goes to War: Methodological Individualism. *Rational Choice and the Political Economy of War. World Dev.* 30, 1845–1864. doi: 10.1016/s0305-750x(02)00120-1

Crandall, J. (2019). Blockchains and the "Chains of Empire": Contextualizing Blockchain, Cryptocurrency, and Neoliberalism in Puerto Rico. *J. Design Stud. Forum* 11, 279–300. doi: 10.1080/17547075.2019.1673989

Croall, J. (1997). *LETS act locally. Growth of Local Exchange Trading Systems*. London: Calouste Gulbenkian Foundation.

Crotty, J. (2013). "The realism of assumptions does matter: Why Keynes-Minsky theory must replace efficient market theory as the guide to financial regulation policy," in *Oxford Handbook of the Political Economy of Financial Crisis*, eds G. Epstein and M. Wolfson (Oxford: Oxford University Press).

Daskalaki, Fotaki, and Sotiropoulou. (2019). Performing Values Practices and Grassroots Organizing: The Case of Solidarity Economy Initiatives in Greece. *Organiz. Stud.* 40, 1741–1765. doi: 10.1177/0170840618800102

Desan, C. (2014). *Making Money: Coin, Currency and the Coming of Capitalism*. Oxford: Oxford University Press.

Desan, C. (2017). "The Constitutional approach to money: Monetary design and the production of the modern world," in *Money Talks: Explaining how money really works*, eds N. Bandelj, F. F. Wherry, and V. Zelizer (Princeton: Princeton University Press), 109–130. doi: 10.1515/9781400885268-009

Dyson, B., Hodgson, G., and van Leven, F. (2016). *Sovereign Money: An introduction*. London: Positive Money.

Earle, J., Moran, C., and Ward-Perkins, Z. (2017). *The Econocracy:The perils of leaving economics to the experts*. Manchester: Manchester University Press.

Fantacci, L. (2013). "Reforming money to exit the crisis: Examples of non-capitalist monetary systems in theory and practice," in *Financial Crisis and the Nature of Capitalist Money: Mutual Developments from the work of Geoffrey Ingham*, eds J. Pixley and G. Harcourt (London: Palgrave).

Geertz, C. (1962). The rotating credit association: A middle rung. *Econ. Dev. Cult. Change* 10, 241–263. doi: 10.1086/449960

Gibson-Graham, J. K., Cameron, J., and Healy, S. (2006). "Commoning as a postcapitalist politics," in *Releasing the Commons: Rethinking the Futures of the Commons*, eds A. Amin and P. Howell (London: Routledge).

Gloerich, I., Lovink, G., and De Vries, P. (2018). *MoneyLab: Overcoming the hype*. Amsterdam: Institute of Network Cultures.

Goodhart, C. A. E. (1998). The two concepts of money: implications for the analysis of optimal currency areas. *Eur. J. Political Econ.* 14, 407–432. doi: 10.1016/s0176-2680(98)00015-9

Graeber, D. (2011/2014). *Debt: The First 5,000 years*. Brooklyn, NY: Melville House Publishing.

Greco, T. (2009). *The End of Money and the Future of Civilization*. Chelsea: Chelsea Green Publishing.

Gross, M., and Siebenbrunner, C. (2019). *Money Creation in Fiat and Digital Currency Systems*. Washington, D.C: IMF Working Paper.

Hayek, F. A. (1990). *Denationalisation of Money: The Argument Refined*. London: Institute of Economic Affairs.

Hess, C., and Ostrom, E. (2003). Ideas, Artifacts, and Facilities: Information as a Common-Pool Resource. *Law Contemp. Problems* 66, 111–145.

Howson, P. (2020). *Climate Crises and Crypto-Colonialism: Conjuring Value on the Blockchain Frontiers of the Global South*. Switzerland: Frontiers in Blockchain.

Hughes, N. and Lonie, S. (2007). M-PESA: Mobile Money for the "Unbanked": Turning Cellphones into 24-Hour Tellers in Kenya. *Innovations: Technology, Governance, Globalization* 2, 63–81. doi: 10.1162/itgg.2007.2.1-2.63

Ingham, G. (1999). Class inequality and the production of money. *Sociol. Rev.* 47, 66–86. doi: 10.1111/j.1467-954x.1999.tb03495.x

Ingham, G. (2004). *The Nature of Money*. New Jersey, NY: Wiley.

Ingham. (2008). *Capitalism*. Cambridge: Polity Press.

Jackson, A., and Dyson, B. (2012). *Modernising Money: Why our monetary system is broken, and how it can be fixed*. London: Positive Money.

Kelton, S. (2020). *The Deficit Myth: Modern Monetary Theory and the Birth of the People's Economy*. New York: Public Affairs.

King, J. (2012). *The Microfoundations Delusion: Metaphor and Dogma in the History of Macroeconomics*. Cheltenham: Edward Elgar.

Kirshner, J. (2003). *Monetary Orders: Ambiguous Economics, Ubiquitous Politics*. New York, NY: Cornell University Press.

Kumhof, M., and Jakab, Z. (2016). The Truth about Banks. *Finance Dev.* 53, 50–53. doi: 10.5860/CHOICE.195229

Kuttner, R. (2013). *Debtors' Prison: The Politics of Austerity Versus Possibility*. New York, NY: Vintage Books.

Lakomski-Laguerre, O. (2016). Joseph Schumpeter's Credit View of Money: A Contribution to a "Monetary Analysis" Of Capitalism. *His. Polit. Econ.* 48, 489–514. doi: 10.1215/00182702-3638655

Lietaer, B., Arnsperger, C., Goerner, S., and Brunnhuber, S. (2012). *Money and Sustainability: The Missing Link*. United Kingdom: Triarchy Press.

MacKenzie, D. (2006). *An Engine, Not a Camera: How Financial Models Shape Markets*. Cambridge: MIT Press.

Malkamaki, M. (2015). *An institutional analysis of savings group development using evidence from Kenya*. United Kingdom: University of Bath. PhD thesis.

Martin, F. (2014). *Money: The Unauthorised biography*. London: Vintage Books.

McLeay, M., Radia, A., and Thomas, R. (2014). Money creation in the modern economy. *Bank Engl. Quart. Bull.* 54, 14–27.

Mellor, M. (2016). *Debt or Democracy: Public money for sustainability and social justice*. London: Pluto Press.

Meyer, C., and Hudon, M. (2017). Alternative organizations in finance: Commoning in complementary currencies. *Organization* 24, 629–647. doi: 10.1177/1350508417713216

Meyer, C., and Hudon, M. (2019). Money and the Commons: An Investigation of Complementary Currencies and Their Ethical Implications. *J. Bus. Ethics* 160, 277–292. doi: 10.1007/s10551-018-3923-1

Morozov, E. (2019). Digital Socialism? The Calculation Debate in the Age of Big Data. *N. Left Rev.* 116/117, 33–67.

Muniesa, F. (2014). *The provoked economy: Economic reality and the performative turn*. London: Routledge.

Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*. Switzerland: Springer Nature.

North, P. (2007). *Money and Liberation:The micropolitics of alternative currency movements*. Minnesota: University of Minnesota Press.

North, P. (2018). *Alternative Currency Movements as a Challenge to Globalisation? A Case Study of Manchester's Local Currency Networks*. Florida, FL: CRC Press Inc.

Ostrom, E. (1990). *Governing the Commons: The evolution of institutions for collective action*. Cambridge: Cambridge University Press.

Ostrom, E. (2000). Collective action and the evolution of social norms. *J. Econ. Perspect.* 14, 137–158. doi: 10.1257/jep.14.3.137

Ostrom, E. (2010). Beyond Markets and Stages: Polycentric governance of complex economic systems. *Am. Econ. Rev.* 100, 641–672. doi: 10.1257/aer.100.3.641

Perelman, M. (2006). *Railroading Economics: The Creation of the Free Market Mythology*. New York, NY: NYU Press.

Pettifor, A. (2017). *The Production of Money: How to Break the Power of Bankers*. London: Verso.

Read, J. (2009). A Genealogy of Homo-Economicus: Neoliberalism and the Production of Subjectivity. *Foucault Stud.* 6, 25–36. doi: 10.22439/fs.v0i0.2465

Rozas, D., Tenorio-Fornés, A., Díaz-Molina, S., and Samer, H. (2018). *When Ostrom Meets Blockchain: Exploring the Potentials of Blockchain for Commons Governance*. New York, NY: SSRN.

Ruddick, W. O. (2020). *Community Inclusion Currencies (CICs): Funding Sustainable Development Goals*. White Paper (accessed May 26, 2020).

Ryan-Collins, J., Greenham, T., Werner, R., and Jackson, A. (2011). *Where Does Money Come From? A guide to the UK monetary and banking system*. London: New Economics Foundation.

Seyfang, G., and Longhurst, N. (2013). Growing green money? Mapping community currencies for sustainable development. *Ecol. Econom.* 86, 65–77. doi: 10.1016/j.ecolecon.2012.11.003

Slater, M., and Jenkin, T. (2016). *The Credit Commons: A Money for the Solidarity Economy*. Credit Commons White Paper.

Storchi, S., and Rasulova, S. (2017). *Impact evaluation of FSD Kenya's savings groups project*. Kenya: FSD Kenya.

Swartz, L. (2017). "Blockchain dreams: Imagining Techno-Economic Alternatives After Bitcoin," in *Another economy is possible: Culture and economy in a time of crisis*, ed. M. Castells (Cambridge: Polity Press).

Tooze, A. (2018). *Crashed: How a Decade of Financial Crises Changed the World*. New York, NY: Penguin Random House.

Vigna, P., and Casey, M. J. (2015). *Cryptocurrency: The future of money?*. London: Vintage.

Werner, R. (2014). Can banks individually create money out of nothing? The theories and the empirical evidence. *Int. Rev. Financial Anal.* 36, 1–19. doi: 10.1016/j.irfa.2014.07.015

Wray, R. (2007). Veblen's "Theory of Business Enterprise" and Keynes's Monetary Theory of Production. *J. Econom. Issues* 41, 617–624. doi: 10.1080/00213624.2007.11507052

Wray, R. (2012). *A meme for money*. New York, NY: Levy Economics Institute of Bard College.

Yunus, M. (2003). *Banker to the Poor: Micro-Lending and the Battle Against World Poverty*. New York: Public Affairs.

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