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Aalto Observatory for Digital Valuation Systems

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Abstract. Money is a recognised factor in creating sustainable, affluent societies. Yet, the neoclassical orthodoxy that prevails in our economic thinking remains as a contested area, its supporters claiming their results to be objectively true while many heterodox economists claim the whole system to stand on clay feet. Of late, the increased activity around complementary currencies suggest that the fiat money zeitgeist might be giving way to more variety in our monetary system. Rather than emphasizing what money does, as the mainstream economists do, other fields of science allow us to approach money as an integral part of the hierarchies and networks of exchange through which it circulates. This paper suggests that a broad understanding of money and more variety in monetary system have great potentials to further a more equalitarian and sustainable economy. They can drive the extension of society to more inclusive levels and transform people's economic roles and identities in the process. New technologies, including blockchain and smart ledger technology are able to support decentralized money creation through the use of shared and "open" peer-to-peer rewarding and IOU systems. Alongside of specialists and decision makers' capabilities, our project most pressingly calls for engaging citizens into the process early on. Multidisciplinary competencies are needed to take relevant action to investigate, envision and foster novel ways for value creation. For this, we are forming the Aalto Observatory on Digital Valuation Systems to gain deeper understandings of sustainable value creation structures enabled by new technology.

Keywords: economic democracy, economic agency, community currency, monetary systems, decentralized technology, experiments

1. Introduction

Current conceptualizations of ownership, exchange, money and economics are being challenged and under redefinition. Proliferation of cryptocurrencies, digitalisation of the society, and the increasing private debt burden, pose increasing challenges to our current economic system. The growing acceptance of Bitcoin, combined with

the governments' relative inability to stop its spreading, the success of Paypal, and the popularity of smartphone payments indicate that people are increasingly willing to use alternatives to the major currencies in their daily life.

The understandings of societal value are still often reduced down to measuring GDP. The monetary system is encumbered by “the myopic focus on monetary exchanges regardless of the broader-term consequences for society at large.” [1:35]. From a wider perspective, digitalisation is changing the way the whole economy works, creating new pressures to the national and local economies e.g. by posing challenges to economic measurement and taxation. For example, the recent digitalisation report by the Finnish Prime Minister's Office [2] discusses how the Finnish welfare state is about to enter the so-called second era of digitalisation, posing a set of challenges for the economic policy. Especially, the impacts of moving into digital systems are not fully captured in the currently employed measurement practices, leading to a situation where year-to-year real changes in GDP have been underestimated in official statistics. According to them, for example, measurement challenges can be found in gauging the consequences of reduced roles of specialised middlemen and accounting for the rising platform and sharing economy, in which consumers may simultaneously be producers; both of these tend to erode the taxation base.

Furthermore, globally the level of private debt has again exceeded the level prior to the 2008 crisis and near to the year 2000 level, before the Internet bubble burst [3,4]. The only G20 countries where the amount of private debt has decreased after the 2008 financial crises are USA and UK, and even in both of them the amount of private debt seem to be increasing again, starting from 2016 [5]. In our opinion, this increases the systemic risks [6]. It should be also noted that even the European Central Bank has recently admitted that “the exact way in which (the macro-financial linkages) affect the monetary policy transmission mechanism remains imperfectly understood” [7].

If we look at citizens' behaviours and values, we can observe a move towards sharing economies and correspondingly the preference of private owning apparently gradually ebbing [8]. Perhaps the most popular examples of this are to be found in the proliferation in sharing of vehicles (Uber) and housing (AirBnB). Sharing economy is a new technology-driven paradigm that is re-constructing economic relations between citizens faster than any time in previous history.

The varied business models of these sharing schemes carry do not altogether abandon the current capitalist ideas. Current sharing economy is facilitated by platform capitalism described by Srnicek [9]. As the positive consequence of a negative development in the rise of the “platform capitalism” [9], “virtual capitalism” [10], or “modern feudalism” [11], it has become clear there has been a surge of interest in the nature of money.

Advances in networked electronic and wireless technologies have made parallel systems of exchange, such as community currencies, time banks, and Local Exchange Trading Systems (LETS) easier and more efficient. New types of currencies have a potency to scaffold for the shift from the scarcity and separateness of our societies supported by the current economics towards affluence, equity and well-being [e.g.1, 12].

To study these issues and trends, we are in the process of founding the Aalto Observatory on Digital Valuation Systems. One of the main goals of the observatory is to understand the role of technology in the creation of sustainable digital valuation systems, including effects of transactions transparency and money creation structures to citizens and society at large. Technology holds the capacity to promote sustainable development, but the use of any particular technology, e.g. distributed ledger or the blockchain technology, does not by itself guarantee sustainable and fair solutions. Moreover, it is only when developers and users organise themselves to apply carefully designed technology that old centralised models can change and give space to parallel systems. Our work connects research and practice. We aim to work in real-world settings with context-sensitive design. Our work has started from Aalto University. We are looking for new academic partners, especially but not exclusively, in social sciences; the call is for partners with interest in local society futuring and economics.

In this position paper, we briefly present the objectives of the observatory. First, in Section 2, we discuss the overall societal need for currency innovation and new valuation systems. Then, in Section 3, we discuss the potential of parallel valuation systems to act as a vehicle for a more democratic economy. In Section 4 we visit shortly our empirical work plans, and finally, Section 5 concludes this paper.

2. Monetary system is changing

After some 30 years of research and development, cryptocurrencies are finally reaching a level of maturity where they are gradually taking over a non-marginal fraction of the global economy. While the roots of micropayment protocols and cryptocurrencies can be traced back to the early 1980s [13], their first proliferation took place only in the 1990s, with Chaum's DigiCash, Wei Dai's "b-money," and Nick Szabo created "bit gold". However, only now, about 10 years after the introduction of Bitcoin, we can see the beginnings of a larger societal acceptance of digital currencies. The recent banning by China and South Korea of the so-called Initial Coin Offerings (ICOs) indicate clearly how the governments are growing wary of the phenomenon, indicating that the governments are feeling threatened by the situation. World might see cryptocurrencies induced by major private sector actors soon. Asian retail heavy-weight Alibaba has shown plans to launch their own currency, governmental regulation allowing.*

Public discourse around cryptocurrencies has thus far been dominated by unethical currency initiatives and practices. At the moment currency innovations may appear threatening for many people. On the positive side, however, there is a newfound interest in designing and studying a sustainable monetary life from the bottom-up. Various types of technology-enabled community currencies have been risen to influence in the years following the financial crisis. When the conventional monetary systems fail, alternative means of exchanging goods and services offer a crucial supplement. Evidence from varied studies suggest that they can provide for localities in ways that conventional money cannot. [29, cf. 38-40]

Many doubt the potentials of community currencies to transform the present socio-economic system on a wider scale. Our society is largely based on strong private ownership, having its roots in the Roman law [cf. e.g. 14]. Within this context, there is a general belief that money is a "perfect" medium of exchange, i.e. that with money you can buy things or services "at will" and that money in itself is "value free". However, there is ample evidence that these assumptions about money are false, or more precisely, they are true only under very specific conditions that seem to prevail under idealised conditions but that do not exist in reality [14]. Equally, technology is commonly thought of as "value free". These ideas on economy dictate our thinking. Upon investigating the complementary currency in the form of communal time banking for cultural resilience in Bali, Lietaer and De Meulenaere [15:11] note that:

"Most existing economic theory has as hidden hypothesis that all exchanges need to be facilitated through a monopoly of a centrally controlled currency. Furthermore, conventional economic theory assumes that all currencies are implicitly value-neutral: they are supposed not to affect the transactions or the relationships among the people using it."

Our approach also questions neoclassical "truths". For example, at the social systemic level the very structure of money creation seems to lead to a number of important emergent properties [14]. There seems to be some bases to claim that the current fiat currencies do endogenously lead to increasing inequality [21] and repeating cycles of booms and busts [cf. 6]; it should be noted that the current neoclassical theories attribute both of these phenomena to externalities and deny that they could be endogenous properties of our current economic system.

New ways of thinking about value creation and money is one key to unlock a desirable change [1,16,17]. We suggest that a broad understanding of money and more variety in monetary system are crucial factors in our attempts to further a more equalitarian and sustainable economy. In this we follow many thinkers who have emphasized money's multiple meanings and purposes. New understandings and forms of money can drive the extension of society to more inclusive levels and transform people's economic roles and identities in the process [10]. **

Hart for one, understands money as "an integral part of the hierarchies and networks of exchange through which it circulates" [27:3]. Sharing economy is currently transforming these networks and hierarchies, as ICT-driven conditions, like collaborative technologies, have facilitated the practice of social sharing in becoming economically significant [46]. Sharing economy is creating a totally new techno-economic context for coordination of human sociality. Yet, the concept of 'sharing' is rarely seen in the mainstream economic thinking [43,44]. The growth of sharing markets signifies that value is increasingly created in collaborative processes by a 'multitude' [45] of diverse actors who are carrying roles like producer consumer simultaneously.

Blockchain is proclaimed to be a foundational technology [18]. The blockchain, the root technology of Bitcoin, has been often sited as a case of ICT revolutionising the financial and money sector. However, "blockchain could be better understood as a (r)evolution in institutions, organisation and governance" [11, 34]. They offer possibilities for sharing and commons-oriented communities to develop and grow their

operations while becoming simultaneously more equalitarian and sustainable. As a general purpose technology [42], the blockchain serves as a means to record, in a secure and verifiable manner, a particular state of affairs which has been agreed upon by the network [41].

We believe that the structure of money creation has to change, to embody the shift in the economy, thereby supporting the restoration of commons. Functioning local currencies are examples of such an embodiment in action [17]. New economic models and currencies are not to deplete the fiat money, but to complement it to eventually build financial resilience. Move is towards more personalized currency formations that will be likely to co-exist with the dominant forms. Complementary currencies can work from their own social space without being needlessly “oppositional” towards the official institutions [19]. In short, they can act as a vehicle of change.

Mega trend evangelist John Naisbit has pointed out: “Change occurs when there is a confluence of both changing values and economic necessity, not before.” [20:183]. We see both of these requirements being on verge of reconfiguration. Our working hypothesis is directed to the ongoing third industrial revolution [22]. Our ultimate goal is to prepare for the forthcoming changes.

3. Digital valuation systems as vehicle for economic democracy

We are interested in understanding how ICT changes systems of exchange and how citizens can improve their socio-economic positions through technology-enabled complementary currencies. In the current economic and financial system, individual economic agency is exercised mainly by consuming. Use of both capacities; true individual agency and social agency, are needed to build democracy [10].

Technologies, such as the blockchain and smart ledger technology, are enabling a new system of value that will more truly scaffold for the functionalities required by social sharing paradigm [11]. One application of blockchain is the way it could record networks of credit, or IOUs between participants on the same network. In theory any member of the network could issue their own currency, if they are trusted by other members of the network to redeem their promises. There is no benefit in hoarding the currency, as no interest is paid, and all debits and credits in the system should add up to zero [23]. The blockchain can support a dynamic governance structure where

“...everyone is free to contribute to a particular community in the way they see most fit. In turn they are rewarded with reputation that reflects their influence in the governance of the community. Also, they receive an economic compensation in the form of digital tokens, which can be used to benefit from the services offered by the community, but also represent an actual (equity) share in the organisation.” [11:110]

Following Pazaitis and his colleagues, our position is that the perception of value, within a certain techno-economic setting, it is important to efficiently coordinate human sociality towards what has been widely thought beneficial and to unlock the potential for societies to prosper. Information is best understood not as a rival commodity but rather as a universal commons. Commoning in this context goes beyond the

coordination of resources in common-pool. It is also connected to new ways to govern and to provisioning of goods and services. [11]

Moreover, it is good to acknowledge that prominent economic thinking may profoundly affect our valuations in domains other than finance. ‘Financial assumptions’ structure our understanding and appreciation of fellow human beings [24]. Concepts such as ‘value creation’ render “a variety of social actors as ‘investors’, rather than citizens or publics or protestors, and innovation as an investment rather than collective political decision or choice.” [25:438].

According to Keith Hart [10], to path economic democracy can be found by focusing on the money instruments. To him, these instruments are reforming to compensate the repersonalization of economic life in a world of easy-access information. Hart suggests that a truer economic democracy could be scaffolded for by harnessing on the social and technical forces that have come to threaten life on earth. “We need to grasp the potential of the forms of money and exchange emerging under these circumstances, with a view to developing financial instruments that serve the interests of each of us and people in general.” [10:308].

The monetary system and technology are constructs based on social agreements [1]. These agreements are, in the end, generated between individuals. Therefore, they could and should be rendered suitable for the needs of people and the society. Agreements are fundamentally built on trust between the actors [e.g. 26]. Trust can be built up, and agreements that the currencies hold can be formulated, in multiple ways. Prospective models of complementary currencies can be a relatively potent and communicative way to explore the futures. Citizens can be engaged in the research in generation accessible currency models by means of participatory design inside the experiments.

4. An empirical approach

The goal of the Aalto Observatory on Digital Valuation Systems is to better understand the above issues and other related phenomena through *empirically* studying different monetary and other digital valuation structures, in the form of existing and new community currencies. At first the Aalto Observatory will consist of a multidisciplinary research group across the different Aalto schools, combining capabilities in, for example, economics, engineering, design, and organisation and business studies.

On the practical side, we will both observe existing community currencies and experiment with new ones. We are particularly interested in investigating digital exchange and valuation systems, including ones that are able to explicitly represent multiple, perhaps even conflicting values in exchanges between people. We utilize digital platforms and face-to-face connections to create a holistic, human-centered understanding of the monetary system that supports society’s sustainable and fair development. The call presented by Keith Hart in 2014 is ever more relevant: “We need new methods if we wish to account for how money underpins social identities and relations of conflict, hierarchy and interdependence in the world we are making today.” [27:466].

Research framework will involve linking global processes with regional levels interventions [e.g. 27,28], which is believed to have forward taking qualities. We will work together with the local actors that already have or are in the process of creating new complementary currencies, gathering insights on the fundamental structures of their exchange and valuation systems. To help improve these systems and gain deeper understanding, we will employ the methods of participatory design to sketch trajectories for sustained innovation and development. While efficient technical design is essential, previous studies show that the most successful community currency schemes are those which have designed inside existing communities and local economies, into them, in partnership with their potential users [29,40].

In some of the experiments we will try to separate the three functions of money: unit of account, medium of exchange, and store of value. For example, we will use digital currencies that base their value on peer-to-peer trust (store of value), form liquidity (medium of exchange) using Distributed Ledger Technology (DLT), and use an external measure for the unit of account.

Herein our goal is to verify the hypothesis by Kocherlakota [31], Araujo and Caramo [32] and Hart [30] that a "collective memory" works as a better method for the social allocation of resources than fiat currencies. For Hart, the trust involved resides at the personal level as a duty and in the collective memory of the communities as a part of the culture. This trust allows calculation based on the act of remembering in our daily communications.

The success of the research unit depends on the scale of the experiments and supportive connections. Relying on the evidence gathered on Local Exchange Trading System (LETS) schemes in the UK [33] and the Trueque system in Argentina [34], it can be assumed that to achieve a notable size the alternative economic practices would need to be supported by the government and the state [33,34], notably "if they want to preserve their essence as alternative economic spaces" [34:11]. Public sector can help to legitimise the experiments. In addition to providing insight on the societal processes, governmental officials can equip the experiments with the opening of 'policy windows' [35].****

4. Summary

New economic structures and alternative currencies carry numerous opportunities to advance desirable change in information age economics. At the moment, the scene for local and complementary currencies seems challenging. Yet, it has become apparent that even if the time seems right to think of the economy in alternative ways, a great deal of multidisciplinary academic research, in collaboration with public, private and third sector actors, is needed to make beneficial advances happen in the field of monetary structures. Under the forthcoming Aalto Observatory, we believe that empirical evidence from live experiments can produce the missing insight on digital valuation systems. We believe this process is best brought about by connecting academic capabilities and creating shared understandings to produce future prosperity and well-being.

*) European Commission launches the EU Blockchain Observatory and Forum, European Commission - Press release, Brussels, 1 Feb 2018 http://europa.eu/rapid/press-release_IP-18-521_en.htm Last accessed: 5 January 2018

**) The emphasis of money's multiple meanings can be traced back to Marcel Mauss and Karl Polanyi, which helped them to embrace money's plasticity as a tool for social transformation. [27,36,37]

**) It is also to be noted that complementary currencies discussion are intertwined with political debate. Political outside the scope of this paper even though it should be acknowledged an important discussion in process creating new CC's. For instance, for Hart this proclaimed as the two sides of coin, one side being market and one the politics, in Hart 2001.

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