

DYNDY

a reader on (digital) currency design for the XXI century

AC - Adaptor

< Alternative Currency Adaptor >

Edited by Marco Sachy
with contributions by
D. J. Roio and A. Arvidsson

distributed by



To the Commoners.

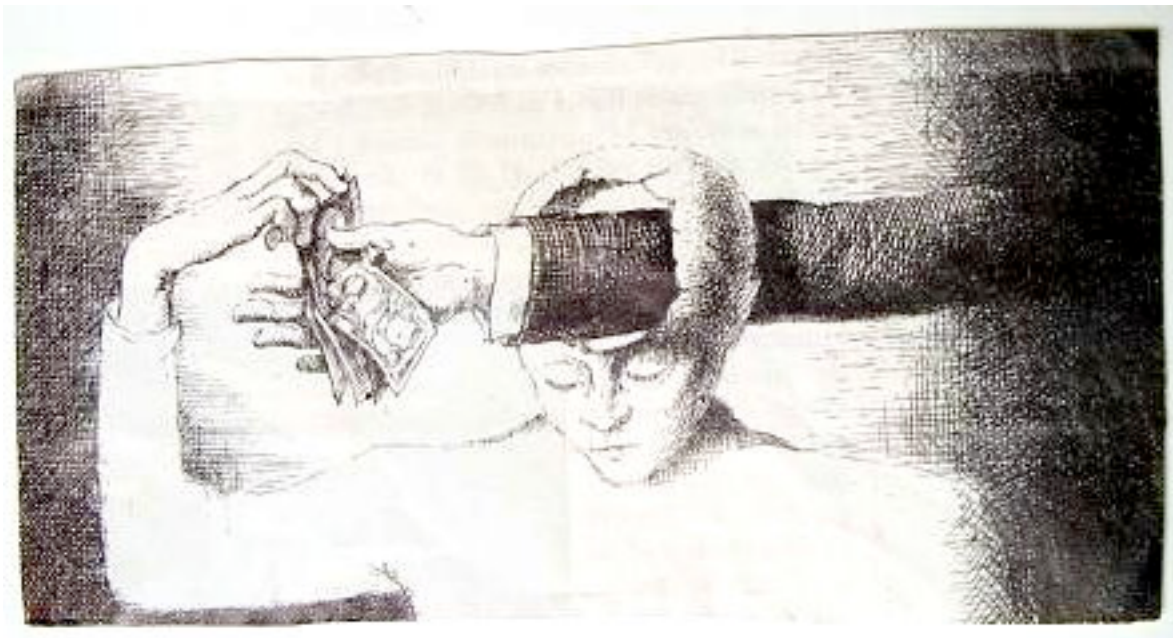


DYNDY Reader - Outline

_DYNDY PHILOSOPHY OF MONEY.....	4
_DYNDY ONTOLOGY OF MONEY.....	21
_DYNDY POLITICS OF MONEY.....	40
_DYNDY APPROACH TO MONETARY POLICY	46
_CONCLUSIVE FEED-FORWARD.....	102
_REFERENCES.....	103

DYNDY PHILOSOPHY OF MONEY

In this introductory chapter, the reader will find herself within the mainframe that constitutes DYNDY's theoretical background and trajectory toward the discovery of digital currency design. We believe in the value of a rhizomatic and nomadic approach to digital currency design, i.e. one stemming from the best - albeit not always the most comfortable - contributions in the recent history of thought before and during the Internet revolution, Gilles Deleuze and Felix Guattari Mille Plateaux. Thusly, we invite the reader to enjoy this exercise between philosophy and economics, a cognitive and semiotic pathway for interiorizing the landscape wherein alternative forms of money find fertile soil for growth.



Think Piece

Across Monetary Paradigms: Monetary Tree and Monetary Rhizome

What we miss is nomadology, the contrary of History.

Velocity transforms the point into a line!

A rhizome does not begin or end, it is always in the middle, among the things, inter-esse, intermezzo. The tree is an affiliation, a rhizome is an alliance, just alliance. The tree imposes the verb <<being>>, but the rhizome has as a

texture the conjunction <<and... and... and...>>.

*- Gilles Deleuze and Felix Guattari, *Mille Plateaux**

Introduction: From *Milles Plateaux* to the Monetary Economic

Mille Plateaux - Capitalism and Schizophrenie is a masterpiece of Post-Modern thought. It is also a precious guide for re-thinking with a critical approach at the selection of the principles leading money and payment systems design. The claim for the urgency to detach from the Modern way to produce subjectivity in the West at least for reasons of mental health (and hence species survival) of the subjects operating in the Modern paradigm is the major contribution of *Mille Plateaux* for conceiving a theoretical reaction to the present economic, *viz.* monetary crisis. In particular, Gilles Deleuze and Felix Guattari teach how to manage the primarily syntactic and epistemic metaphors of the tree and of the rhizome in order to make them two coefficients for the evaluation of the same reality. The latter may well present a monetary-economic ontology, because the 'tree' and the 'rhizome' are two cultural paradigms and, therefore, they may be applied to assess monetary economic theories, the cultures either subsumed in or allowed to emerge from them and the society they in turn model together with the singularities populating it. Thus, Modern society and Modern subjects or Post-Modern societies and Post-Modern subjects? Modern monetary economics or Post-modern monetary economics? Monetary tree or Monetary rhizome? An orthodox single-currency monetary system or a system based on some sort of "polidoxy" such as a

multi-currency one? The second member of the disjunctions is the answer. But let's proceed with order.

Mille Plateaux divides into fourteen plans plus one. Since they do not build up a stable sequential relation through the book, its parts are called *plans*, instead of 'chapters'. According to Deleuze and Guattari,

"[a] book, for it is made by chapters, has its own culminating points, its own terminal points. What does happen on the contrary for a book made by plans that communicate with each other through micro-fissures, as it happens in the brain? We define <<plan>> any multiplicity connectable to other multiplicities through underground superficial stems in order to shape the rhizome and make it growing"¹.

Accidentally, plans in *Mille Plateaux* present a sequential order, but *only* because they are put onto a paper publication. Whereas, Deleuze and Guattari explicitly suggest the reader to engage the book in her/his preferred order. Uniquely the last chapter - as they point out in the preface - had to be read lastly. Indeed, here the authors trace a metaphysical map of the inter-connection of the previous plans. The outcome is a monist perspective, whose features recall Duns Scotus univocity of the being or Spinoza unity of the substance. Here, I will focus on the first chapter of the book, whose very title is in fact "Introduction. Rhizome". The 'rhizome' is a tuber and on that plan Deleuze and Guattari oppose such a cultural and philosophical metaphor to the traditional Modern one of the 'tree' or the 'root'.

On the one hand, the *arborescent* structure is one that resembles a tree in properties, growth, and/or appearance. The structure grows from below (although in the characterization of the monetary tree, the reader will easily acknowledge the necessity to turn it up side down), through one or more shafts onto which ramifications graft themselves by following a hierarchic and dualistic process that dictates points and modalities of the connections between the components. On the other, it is the a-centered structure of the rhizome, whereby any point can be connected to any other point without the need to bypass some sort of privileged points (as it is in the case of hierarchic structures). The most common image apt to describe the rhizome is certainly the Internet, but things are nevertheless much more complex. True, the history of the internet offers a great number of cases in which the reticular structure of the Net had been re-converted into an arborescent one presenting focal points and path-dependence with almost no stochastic traits (e.g. big payment system providers freezing Wikileaks accounts or big Silicon Valley firms violating the privacy of users in favor of corporate interests). How to deal with this apparent paradox of existential co-dependence of tree and rhizome - *mutatis mutandis* - of conventional money and complementary or alternative currencies? Should not one system overcome the other?

In other words, Why do Deleuze and Guattari implement a couple of terms (tree-rhizome) while at the same time - and rather paradoxically - they pretend to philosophize out of the dualistic approach of dichotomic reasoning? Deleuze and Guattari find out the solution for overcoming the conundrums of dichotomic reasoning by appealing to the *becoming*, rather than to the *being* (of physical and metaphysical *enta*) as the Modern tradition prescribed². Deleuze and Guattari focus on the <<between>> rather than on the <<from-to>>. As they point out: "A plan is always in the middle, neither at the beginning nor at the end. A rhizome is made by plans"³. What counts is the process and not the two terms of the opposition: rhizome and tree (or root) are *not* to be thought of

¹ *Mille Plateaux*.

² A name above all is Renè Descartes, who formulated what we call today the mind-body problem with God (viz. the Being) on the background (or 'up there').

³ *Milles Plateaux*.

as dualistic oppositions, but rather “in terms of floating coefficients of evaluation”⁴, holistically like *yin and yang*. In other words, in the states of affairs we experience as humans it is impossible to deal among alternatives between two ‘pure forms’. Rather, in the phenomenic reality we deal with mixed states, in regard of which conceptual *couples* function as coefficients of evaluation. Indeed, a rhizome develops always by risking to get rigid, to close up, to “radicalize”(i. e. for a chronic lack of connections). By contrast, the roots of the tree go deep in the ground in a developing manner, which partly resembles the development of tubers (in the ground themselves)⁵. Thus, rhizome and tree or conventional and alternative forms of money are not *given* once and for all, but they entertain a “perpetual procedural contingency”⁶. For instance, the same holds also for the concept of ‘minor’ in music, which is a variation of the ‘major’. Another way to put it: a de-territorialization starts always from a previous territorialization. And this pattern, as the reader will acknowledge below, holds also in the monetary domain.

In sum, *Mille Plateaux* is “a book-rhizome equipped by an incredible ability to chain with our present while intervening on the most problematic knots that shape our subjectivity against the caged individuality promoted by the [principles of] neo-liberal globalization”⁷. Deleuze and Guattari stress that they wrote *Mille Plateaux* “as a rhizome. [They] composed it with plans. [they] gave it a circular shape, but as a joke. Every morning [they] used to wake up and each of [them] wondered which plan he would have chosen, while writing five lines here and ten there. [Each and every] plan can be read in whatsoever order and put in whatsoever relation with any other. For multiplicity, there is the need for a method that really does it”⁸. This is the main reason for the inception of DYNDY, namely to assess the contemporary global economic crisis at the ‘monetary economic’ level by domesticating this kind of inter-paradigmatic and philosophically rich method of analysis, which works also for currency design *per se*. *Mille Plateaux* is a book written in a non-conventional way, which enables to cross paradigms thanks to the always different connections that Deleuze and Guattari approach to both writing and knowledge enables and encourages. Thus, in order to understand DYNDY approach to digital currency design, it is worth to notice the theoretical utility of the concept of the tree in order to assess the Modern monetary paradigm and that of the ‘rhizome’ to get to an adequate methodological picture of the alternative possibilities that this metaphor offers for conducting R&D in monetary economics. Such metaphors will be the two floating coefficients against which, in the following sections, I will operate a cross-paradigmatic assessment of the ‘monetary economic’.

Hence, as a working definition of *Mille Plateaux*, I suggest the reader to stick to that one of Massimiliano Guareschi: “[it is] a visionary cartography able to get and see everywhere potentials for mutation, starting from a very anti-utopian perspective and therefore a radical one, liberating and vitalistic”⁹. I will thereby propose a very liberating and today more and more *vital* (rather than vitalistic) paradigm shift of the monetary economic. I will thus start with an appraisal of the tree and the rhizome as Deleuze and Guattari present them in *Mille Plateaux*. I will then refer to Douglas Rushkoff (2009) or the very same publications of prominent monetary institutions in order to give the reader an idea of the monetary tree, *viz.* the monetary expression of the economic paradigm of Modernity, under the vestiges of a hierarchic and centralized structure. In section 4 I

⁴ Massimiliano Guareschi, 2006: 19.

⁵ *Ibid.*

⁶ *Ibid.*

⁷ Massimiliano Guareschi, 2006: 22-23.

⁸ *Mille Plateaux*.

⁹ Massimiliano Guareschi, 2006: 25.

will then make the same exercise around the notion of monetary rhizome in order to show the need to metamorphosize the monetary paradigm of Modernity through the introduction of mutations (i. e. new theoretical and practical *meanings*, i.e. *means* of payment such as alternative and complementary currencies) in the traditional and centralized monetary system. The overall call is for the graft of monetary rhizomatic elements onto the structure of the monetary 'tree' as a desirable process for both a most desirable monetary paradigm-shift and liberating consequences in favor the singularities shaping the Multitude.

Tree Vs Rhizome: a comparative introduction of the modern and post-modern philosophical and cultural paradigms

In this section I will present the two metaphors of the tree and of the rhizome throughout the very same words of the authors. This will enable me to put *in the middle*, and thus to share with the reader, the features of the monetary economic analysis (or analogy? or still allegory?) that I will accomplish in the next two sections. Both monetary tree and monetary rhizome are to be thought of as semiotic expressions of two slightly different possible representations of human monetary economic organization. This is not intuitively clear at first. As Deleuze and Guattari put it:

“Why is it so difficult? Because it it a question of semiotic perception. It is not easy to percept things through the middle, and not from the top to the bottom , or from left to right. You will try and you will see all change. It is not easy to see the grass into things and words (in the same way as Nietzsche said an aphorism had to be “ruminated” and that a piece of flat land is not detachable from the cows populating it as it is for the clouds from the sky)”¹⁰.

In fact, what follows is primarily the expression on paper of a much more general semiotic process, a question of perception around the monetary economic, here appraised through the lens of Deleuze and Guattari post-modern and inter-paradigmatic approach. However, I will navigate the opposite verse of the stream. The reader might recall that Deleuze and Guattari highly valued science because it offered a storage of propulsive concepts from which new philosophical theoretical peaks could have been reached. By contrast, I will endorse Deleuze and Guattari philosophical approach in order to suggest new paradigmatic methods to deploy in theorizing and implementing monetary economics for policy purposes. Although they do not offer a canonic analytical account of the features of the two metaphors, Deleuze and Guattari characterize the approximative features of both the rhizome and the tree in very detail. The metaphor of the tree is unfold as follows:

“It is strange how the tree dominated Western reality and all its thought, from botanics to biology, passing through anatomy, but also gnoseology, theology, ontology, the whole philosophy... the foundation-root, *Grund*, *roots*, *foundations*. The West has a privileged relation with the forest and deforestation (italics in the original)”¹¹.

¹⁰ *Mille Plateaux*.

¹¹ *Mille Plateaux*.

Thus the tree represents the metaphor of Modern knowledge and Modern methods and models not only to construct but also to transfer knowledge, including monetary economic knowledge and its implementation in building up monetary systems. The tree has a unique root, the point of hegemony, from which the whole system is governed and *nurtured*, i.e. world central banks' reserves. The result is a hierarchic, vertical and centralized system presenting different hierarchic tiers less and less influential in direct relation to their distance from the root (e.g. root, trunk, branches, foliage). This model has been operating on the human stage for the last four hundred years, i.e. Continental Modernity - from Descartes' *Discourse* to Heidegger's *Sein und Zeit*, as Modern philosophy then died in Auschwitz... as a leading epistemic and - therefore - power metaphor: the genealogical trees of royals, for an example out of philosophy. Moreover, at the origins of Modernity all intellectual people still entertained a firm believe in God who wrote the *Bible* through men's hands (see the tree of knowledge in the middle of the garden of Eden in *Genesis 2:9*). God was considered also the writer of the Book of Nature and Modern authors such as Francis Bacon firmly believed they were to decrypt the Book of Nature (see Figure 1b), thus reading nature through the eyes of its creator. To make a long story short, as Michel Foucault writes in *The Order of Things*:

“The great metaphor of the book that opens, that one pores over and reads in order to know nature, is merely the reverse and visible side of another transference, and a much deeper one, which forces language to reside in the world, among the plants, the herbs, the stones, and the animals” (Foucault, 1966).

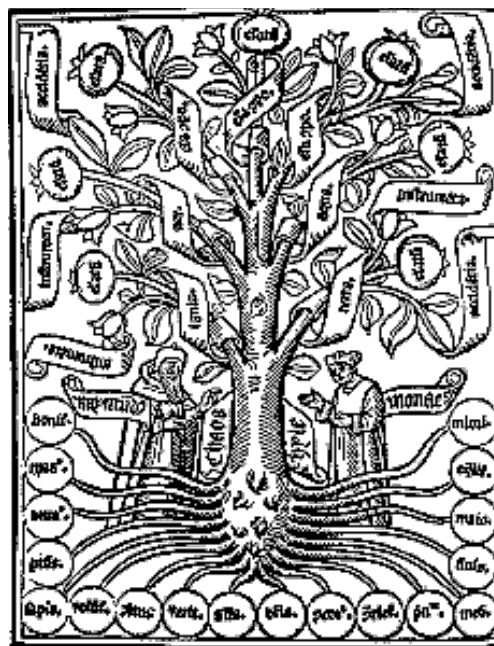


Figure 1a: arborescent structure in hierarchically organizing knowledge.

Thus, the tree had been (and still is in the mainstream of thought production) the leading epistemic metaphor of Western way to construct knowledge and put a sort of mimetic-semiotic order in an apparently chaotic reality.

However, there are different possible metaphors alternative to that of the tree, which defines the Modern paradigm of the West. To paraphrase Richard Rorty (1979), one may cling to them in different semiotic perceptive processes, whose outcomes will eventually differ from traditional Modern patterns that we are constitutively acquainted to. The rhizome is one of them and between the principles that drive the rhizome own development, I will limit my analysis to two of them: the

principle of connectivity and the principle of heterogeneity¹². Among the principles of the rhizome, they are the most important to be applied for a novel acknowledgement of the monetary economic. Indeed, Deleuze and Guattari

“[summarize] the principal features of a rhizome: in contrast with trees and their roots, a rhizome connects whatever point with whatever other one [connectivity] and each of its traits do not remand necessarily to traits of the same nature. [The] rhizome cannot be reduced to the One or the Multiplicity. [The] rhizome is not made by units, but rather by dimensions and moving directions [heterogeneity]. It does not start and it does not finish, but it has always a center from which it grows and overflows”¹³.

The rhizome is thus more than ‘a metaphor of the Internet’. Indeed, they proceed:

“Contrary to what happens to graphism, painting or photography, the rhizome refers to a paper that has still to be produced, built up, always jointed, connectable, with multiple entrances and exits, with its lines of escape”¹⁴.

And from paper the next connection is with language. Deleuze and Guattari indeed criticize Chomsky’s syntagmatic tree, for it “still begins at a point S and proceeds by dichotomy. [Chomsky’s] grammaticality, the categorical S symbol that dominates every sentence, is more fundamentally a marker of power than a syntactic marker: you will construct grammatically correct sentences, you will divide each statement into a noun phrase and a verb phrase (first dichotomy...)”¹⁵. This is expressed graphically in Figure 2, below:

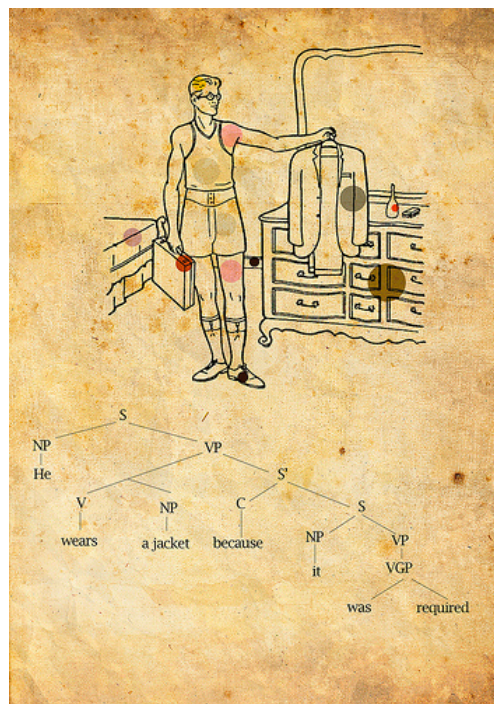


Figure 1b: The Chomskian Tree, thus the metaphor of the tree in Western Philosophy of Languages.

¹² Deleuze and Guattari enlist also: the principles of multiplicity, as signifying rupture, cartography and decalcomania.

¹³ *Mille Plateaux*.

¹⁴ *Mille Plateaux*.

¹⁵ *ibid.*

For instance, this very same prescriptions guide through language the student's mindset and its becoming a politically correct scholar or professional. Indeed, as an interesting matter of fact students go to Uni-versi-ty. Therefore, since the process is dichotomic in the first place, those guidelines prescribe a constrained semiotic perception from the part of the *subordinated* subject and thus an incomplete ability at critical thinking concerning potential future members of the hierarchic establishment, part of which dedicates to manage the international monetary system from top positions in international monetary institutions¹⁶.

Deleuze and Guattari oppose the rhizome to such a monolithic and constraining perspective on language, thought production, knowledge transmission and power management:

“A rhizome ceaselessly establishes connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles. A semiotic chain is like a tuber agglomerating very diverse acts, not only linguistic, but also perceptive, mimetic, gestural, and cognitive: there is no language in itself, nor are there any linguistic universals, only a throng of dialects, patois, slangs, and specialized languages. There is no ideal speaker-listener, any more than there is a homogeneous linguistic community. Language is, in Weinrich's words, "an essentially heterogeneous reality." There is no mother tongue, only a power takeover by a dominant language within a political multiplicity”¹⁷.

Therefore, Deleuze and Guattari critique of Chomsky's analytical dichotomic framework put firstly on evidence that both tree and rhizome are metaphors functioning as methods, as processes of development of whatsoever inter-connected structure including a theory of syntax in linguistics or a multi-currency monetary system in the economy. For instance, a rhizomatic syntax is well expressed by the multi-medial featuring of the Web: here the production of knowledge is not confined in printed books, whose sentences are written by following a syntax based on the Chomskian dichotomy, but rather there is a multi-dimensional way to build up the argument for bearing one's thesis¹⁸. It is a way to grow for a developing power structure, i. e. a monetary system based on a multi-currency horizontal and a-hierarchical framework instead of a centralized, top-down, monopolistic, tree-like one. With a serendipitously meaningful passage for critical thinkers within, for example, the Bitcoin community today, Deleuze and Guattari pointed out:

“Against centralized systems (or even poli-centric systems), with hierarchic communication and pre-established connections, the rhizome is an a-centered, a non-hierarchic and a non-significant system, without general in chief, with neither autonomous nor central organizational memory, defined only by the circulation of states. The issue at stake in the rhizome is the relation with all the kinds of *becoming* (italics added)”¹⁷.

At this point, Deleuze and Guattari mention a kind of becoming-structure very important for the following analysis: Western bureaucracy. According to Deleuze and Guattari “its agrarian and cadastral origin, roots and fields, trees and their border-role, the big census by William the Conqueror [in 1085], feudality, the politics of the Kings of France - to consolidate the State on property, to share out land through warfare, trials and weddings. The Kings of France chose the lily, because it is a plant with long roots clutched onto escarpments”. The resemblance of the metaphor is even iconic (the lily as the symbol of the most powerful force ‘on the ground’), but most importantly the arborescent structure of bureaucracy resembles the same meanings (either literal or figurative) of arborescent words permeating all banking culture through centuries.

¹⁶ A name above all is Larry Summers. For an academic discussion, please see Hausman and McPherson, 2006: 12 - 29.

¹⁷ *Mille Plateaux*.

¹⁸ The peer-to-peer horizontal organization of information flowing on the web is another aspect resembling the features of the rhizome: i. e. writing an abstract in XHTML with all the possibilities to link whatever virtually *ad infinitum* is different than on paper with a pen.

Indeed, this kind of bureaucracy structured also the monetary institutions of Modernity - therefore since the XVII century - until the present century, from *tally sticks* onwards. This is noteworthy because if it is enough to endorse different modeling metaphors in order to shape differently reality, then there is at least a purposeful alternative for a paradigm shift corresponding to a recovery from cultural crises, philosophical or monetary-economic they might be.

Intermezzo

As a rhizomatic micro-fissure for the migration into Monetary Economics, I express here an historical remark to cross from *Mille Plateaux*, which describes the tree at a philosophical level to Douglas Rushkoff's *Life Inc. How the World became a Corporation* - a book describing the arborescent, centralized, hierarchic structure of monetary institutions such as central banks - I recall that (1) the mechanistic worldview of Modern philosophy usually dates back to the works of Descartes (1596 - 1650), thus between 1618 (*Compendium Musicae*) and 1657 (*Correspondence*), (2) Modern monetary institutions began to emerge in the same years: for instance, the Riksbank in Sweden Bank was chartered in 1668 while the Bank of England in 1694. And (3) a rather technical booklet, which was nevertheless written for the general public and published by the Federal Reserve of Chicago in the early 1990s is entitled (of course coincidentally) *Modern Money Mechanics*.

The Monetary Tree: Modern Monetary Systems

In virtue of its most acknowledgeable features, the monetary tree represents the traditional, centralized Modern monetary system, also known as *central banking*. At the international level - or first hierarchic tier - operate institutions such as the Bank for International Settlements, the International Monetary Fund and the World Bank representing the top level of hierarchy in the global banking system. Here, the *root* of monetary power is very well reached through the imposition and management of international reserves at a global level. Thus, the structure is arborescent, but the reader may recall my suggestion to turn the tree up side down: the hierarchic structure is such that the root of the monetary power is not at the bottom of the monetary system, but in fact it is rather at the top.

In order to show how the monetary tree is basically structured, at the national level - or second hierarchic tier - I will refer to a paradigmatic example of Modern banking, the century-old Federal Reserve of the United States. In the case of the FED there is a hierarchic order presenting the Boards of Governors at the FED in Washington D. C. at a higher position with regards with other twelve Federal Reserve Banks, the third hierarchic tier in the US. Tiers 1 and 2 form the Federal Reserve System, see Figure 2a:

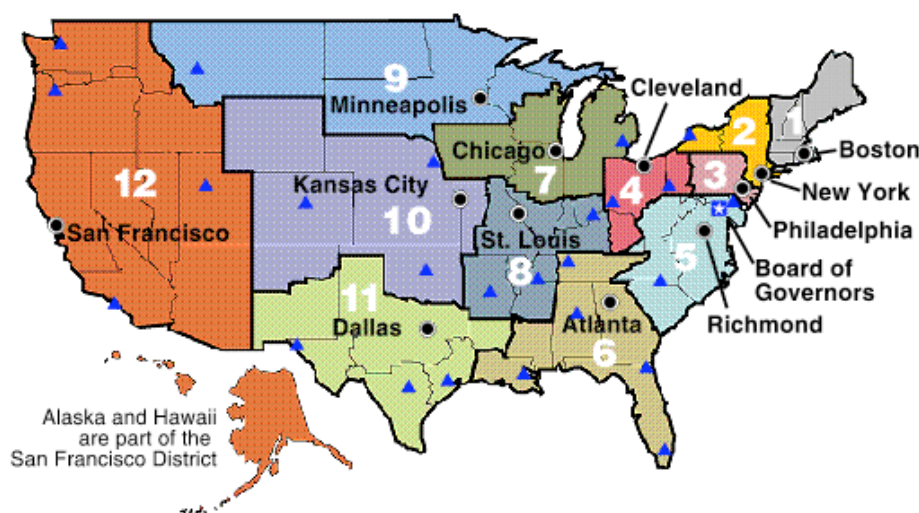


Figure 2a: The root of the tree is the Board of Governors signed as a star on the map in D. C. By contrast, circles signal the subordination of the other FED banks in correspondent cities (blue triangles are not relevant for the present discussion)¹⁹.

Further, each Federal Reserve Bank aggregates under itself a number of member banks, namely local commercial banks - fourth hierarchic tier - and so the fractal pattern goes until reaching the individual deposit account, level of zero hierarchic influence, a leaf on the tree. It is easy to notice why I suggested above to turn the tree up side down: the result is a pyramid (see Figure 2b below):

¹⁹ FED - Beige Book, 2009.

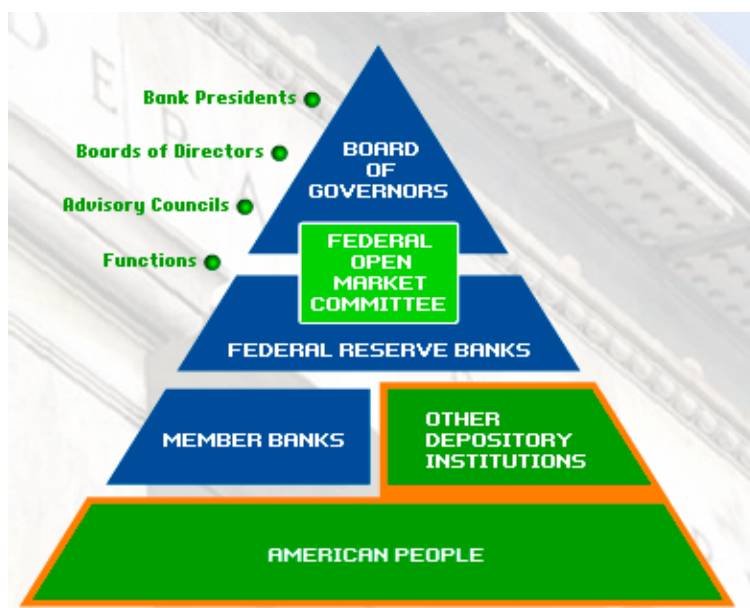


Figure 2b: Hierarchic, arborescent, centralized structure of the FED..

Moreover, the very same classification or taxonomy of money the monetary tree prescribes a hierarchic relation of formulation:

- 1) M0: notes and coins in circulation; level zero of banking hierarchy as I stated above (minted by Treasury)
- 2) M1: M0 + deposits;
- 3) M2: M1 + savings (M2 is used to forecast inflation);
- 4) M3: M2 + institutional money-markets funds, larger liquid assets; first level of banking hierarchy as I stated above²¹.

The organizational structure of the FED in an internationally recognized standard for monetary management for central banks (i . e. the ECB - the European Central Bank in Frankfurt am Main - follows in principle the same blueprint), but how did Modern Western nations get to adopt almost exclusively such centralized monetary system? According to Douglas Rushkoff, professor at NYU's Interactive Telecommunications Program,

“We have to go back to the Renaissance just one more time to trace the origins of the stuff we currently call money. The currency system we still use today was invented with biases [that] promoted the power of central authorities and the assets of the already wealthy, while reducing the ability of smaller groups and local regions to create value for themselves. This is almost an untold story. History books gloss over or omit entirely the process through which monarch outlawed certain currencies while promoting others”²².

Thus the monetary tree is the Modern paradigm that we are used to consider as *natural* when we think about our monetary system. We do not look at it as the result of the appeal to a peculiar

²⁰ Notes to Figure 2:

(1) The Federal Open Market Committee has the function to manage the fluctuations of the monetary system and possibly ignite them through Open Market Operations mostly run in New York.

(2) The Board of Governors in Washington D.C. has exclusive discretionary monopoly of decision making about interest rates settings and thus on inflation management outcomes in virtue of the powers conferred to the Chairman.

²¹ Source for M-money definitions, <http://www.investopedia.com/>. Visited on Dec. 5th 2009.

²² Rushkoff, 2009: 162.

coefficient of evaluation of our monetary reality. What's more, there is also a natural inclination to consider a central authority as an unavoidable institution for managing the monetary system:

“Our money is lent into existence by a central bank. This bank is usually a private corporation chartered by the government to manage currency. [The] corporation [say the FED to stick to the example above] lends a certain amount of money to a smaller bank, which lends it to a company or to a person. It has to be paid back, at some rate of interest, to each lender [usually a ‘branch’ of the FED] by each borrower [a ‘leaf’, for simplicity the straw man of a natural person]” (*Ibid.*).

There is only a problem as Rushkoff points out: “Less money is lent into existence that needs to be paid back” (*Ibid.*). This apparently odd assertion is nevertheless far from being false. In fact, the Modern and tree-modeled monetary system functions precisely as such. According to Rushkoff and more in general to common maths, “if the bank lends a company \$1 million to start a business, that company will have to pay back, say, \$3 millions by the time the original loan comes due” (*Ibid.*). Even the very same practice at the *root* of Modern central banking, viz. “fractional reserve” banking (the practice to lend more money than a bank actually has - up to 90% of the actual reserves with reserve requirements at 10% for the FED), is not enough to enable *all* the borrowers to pay back their loans, namely principal plus interest applied by the bank lending the money²³. Some of them will go bankrupt. And it could not be different:

“Whether we judge it to be a good or a bad thing, there is not escaping from the fact that the agenda of central currency - the bias if this medium - is to promote competition, require the expansion of the economy, and increase overall indebtedness to the central bank. *Central currency favors central authority*, because it is created by a central, chartered monopoly, with the provision that it be paid back to the central bank with interest. Those on the periphery [the ‘head of hair’, the foliage of the monetary tree, thus the american people in Figure 2] owe while those in the center [the root of money management, the top sector in Figure 2,b thus the banking system and its owners] grow. [The] rules of the currency create a slope of value and authority towards the center (*italics added*)”²⁴.

Rushkoff's positions well represent in the monetary economic field Deleuze and Guattari analysis of the tree in Modern philosophy: the monetary tree is so *radicalized* that nobody put at stake the legitimacy of the existence of both monetary and banking systems, which actually brought about the biggest economic crisis since Modern money and Modern banking exist. The ramifications of this are staggering, but I will conclude this section only by presenting the most important features of Modern monetary systems shaped through the evaluative endorsement of Deleuze and Guattari coefficient of the tree.

In short, the Modern paradigm of the monetary tree is based on very precise and particular principles, which are among the others:

- 1) Scarcity of the currency in order to induce competition.
- 2) Centralized management;
- 3) Hierarchic, oligarchic and elitist administrative bureaucracy;
- 4) Top-down and strictly discretionary policy strategies carrying out redistribution inefficiencies and injustice.
- 5) Indefinite debt at interest to run the system itself.

Although “for most everyone alive today, this is just how money works” (*Ibid.*), the monetary tree is a cultural metaphor fostering a monetary system, which does not include by design those

²³ The leading principle is that for modern banking the cash reserves at the bank available to repay demand deposits need only be a fraction of the demand deposits owed to depositors.

²⁴ Rushkoff, 2009: 163.

principles that would enable the economic agents - the singularities animating the Multitude - living into the system to contrast the problematic issues Rushkoff presented above. The only possible way to get rid of the consequences of the 2008 economics crisis that the Modern and monolithic paradigm of the tree still brings about is to construct a monetary system designed by endorsing Deleuze and Guattari principles of connectivity and heterogeneity. In the next and final section, I will show that free thinkers in economics and ecology have recently accomplished this very result.

The Monetary Rhizome: Post-Modern Monetary Systems

Pre-Modern history offers a picture of the monetary rhizome, which very well resembles the features of Deleuze and Guattari alternative and Post- Modern coefficient of evaluation:

“The last time most people enjoyed access to multiple currencies was in the late Middle Ages. From about the tenth through the thirteenth century most of Europe enjoyed two main kinds of currency: centralized money, used for long-distance transactions, and local currency for daily transactions. Local currency worked very differently from centralized currency. Instead of being issued by a central bank, it was quite *literally worked into existence* [as the rhizome is “paper still to be produced”] , accurately reflecting the bounty produced”²⁵.

The monetary rhizome represents all the (literally!) alternative possibilities to design currencies for holistically integrating the Modern paradigm of the monetary tree and to evolve the ontology of money in a desirable direction with respect to the wellbeing of users. Furthermore, it *is* a rhizome because it enables to connect parameters belonging to different domains of existence (ethic, economic, social, environmental, etc.) to design the most suitable currency needed in the social economic context one will to fulfill them. An intuitive graphic example of monetary rhizome made by different clusters of local currencies systems might then be as follows:

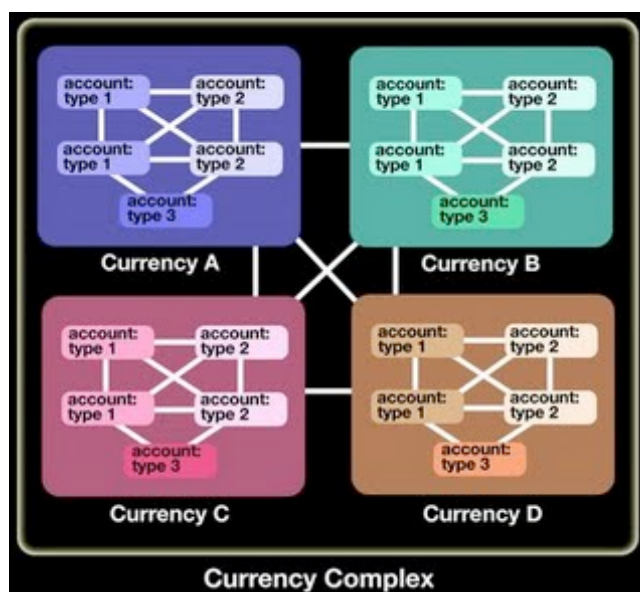


Figure 3a: example of multi-currency system: rhizomatic heterogeneity and connection.

²⁵ Rushkoff, 2009: 163 - 164 (Italics added).

For instance, the implementation of this sort of currency complex is possible by running local monetary systems in parallel with the monopolistic national one through the implementation of complementary currencies with the involvement of local authorities in order to make heterogeneity a force together with - and fostered by - new constellations of connections among different dimensions shaping the monetary economic. Indeed, the monetary rhizome is named as such because the alternative process of currency design resulting from it semiotically resembles the features through which Deleuze and Guattari characterized the rhizome in *Mille Plateaux*. They aimed at an application of the principles of heterogeneity and connectivity in philosophy for a critique to capitalism. Seemingly tapping into the same morphogenetic field, currency architect Bernard Lietaer and Prof. Robert Ulanowicz (unwittingly?) apply the resonant ones of 'diversity' and 'interconnectivity' within the constraints of monetary economics for structurally fixing the economic crisis that a schizophrenic capitalism inherently generated. In their seminal co-authored article "Is Our Monetary Structure a Systemic Cause for Financial Instability? Evidence and Remedies from Nature", Lietaer and Ulanowicz *de facto* framed the rhizome in their interdisciplinary study of monetary solutions to critical states of the economy.

As for the principles of connectivity and heterogeneity, Deleuze and Guattari stated that the rhizome connects whatever point with whatever other one while it is not made by units, but rather by dimensions and moving directions. In the same fashion, alternative forms of money such as complementary currencies call for a cultural upgrade of society in terms of an increase in the *types* of currencies as vehicles for connecting agents in the economy. According to Lietaer and Ulanowicz, by mimicking natural ecosystems the implementation of different types of currencies will change the structure of the monetary system and, by definition, such change will ameliorate the level of overall systemic resilience, which indeed depends on optimal levels of interconnectivity among the parts of the economy. This in turn will increase the structural sustainability of the monetary system. The price to pay for such enhanced resilience and sustainability is a decrease in total systemic efficiency, which is possible thanks to the streamlining that a single-currency system allows for: diminished efficiency is exactly what "enables the economy to flow back toward greater sustainability" as the thick upward arrow in Figure 3b shows²⁶:

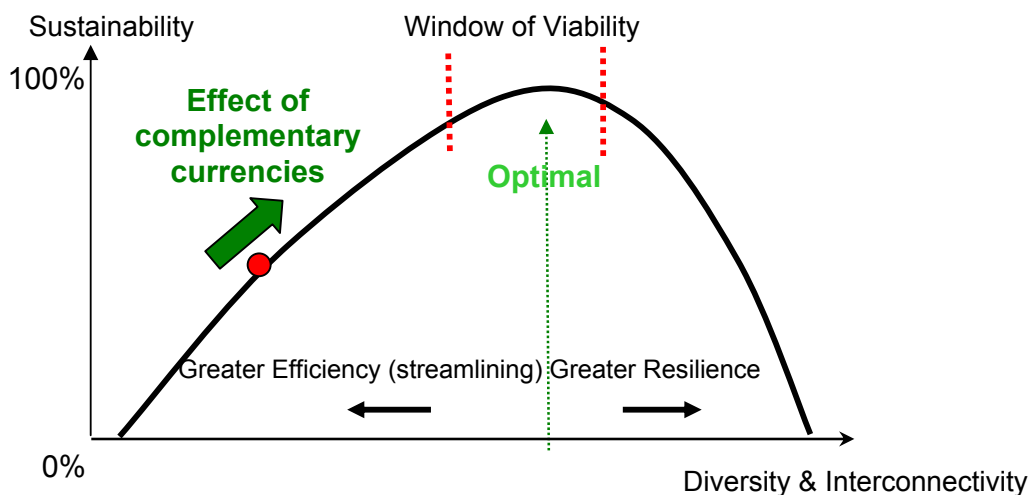


Figure 3b: the implementation of different types of currencies leads the state of the monetary system toward the parametric levels of the window of viability, i.e. greater sustainability (graph by and courtesy of Bernard Lietaer).

²⁶ Lietaer and Ulanowicz *et al.*, 2010:13.

In a nutshell, the possibility to make more (rhizomatic) connections through the use of different types of currencies will enhance the potential capability of every economic agent to virtuously respond to unexpected or unpredicted systemic failures in the brittle world of modern bank money.

Complementary currencies "refer to an agreement within a community to accept a non-traditional currency as a means of payment"²⁷. Although Lietaer adopts the term 'currency' instead of 'money', this terminological choice is not a significant nuisance. Modern bank money is in fact mostly thought of as conventional national currencies, which are *de facto* the most common form of money in circulation. Indeed, currencies are money in that they have the quality of being generally accepted or in use within a community. What Lietaer put on evidence by choosing the term currency is the reference to a particular system of money in general in use in a particular local community, country or groups of countries. Complementary currencies are then negotiable instruments designed in order to facilitate trading by virtue of enhanced interconnectivity of the system as a whole, esp. in those situations in which the supply of conventional national currency is tight. But more than a useful cushion in times of shortages of money, complementary currencies are remarkably significant agreements, because they "facilitate transactions that otherwise wouldn't occur, linking otherwise unused resources to unmet needs, and encouraging diversity and interconnections that otherwise wouldn't exist"²⁸ at the socio-economic and geopolitical level.

This is a possible, and desirable, direction for negotiating with central authorities and hierarchic structures mostly over-imposed not only in monetary management and monetary systems design but also in larger dimensions of society. In view of a cultural adaptation to alternative forms of money, the rhizome is indeed a leading epistemic metaphor very apt to construct a theory and a narrative of multiplicity also in monetary economics. In effect, one can either plant a tree and obtain cultural fruits such as Keynes' *Treatise on Money* and Keynesianism as foliage or she can cultivate rhizomes in order to build up a new and immanent epistemic experience as it is echoed in the title of Lietaer's *The Future of Money - creating new wealth, work and a wiser world*. In the former one finds a systematic and analytical treatment of the topic in order to deal with one currency in one system out of time (or forever?). In the latter there are *different* currencies operating at the local level and run in parallel with the national one. It is in other words the *n-1* way of reasoning, the negative dialectic one. This is why those alternative and complementary currencies are apt to define the monetary rhizome rather than the positive - and in some cases still positivistic - monetary-tree approach to monetary economics, i. e. all mainstream theory and policy.

In conclusion, there is no conclusion, just not-yet-emerged plans connected by points of intensity and non-yet-designed currencies connecting alternative economies: DYNDY approach to currency design is in one word *antifragile* (Taleb, 2012). The graft of monetary rhizomatic elements onto the structure of the monetary tree is a desirable process for both the urgent monetary paradigm-shift and its liberating consequences in favor of the socio-economic stances of the Multitude. In other words and hopefully in variations of Bitcoin blockchains, the monetary rhizome may be a leading metaphor for constructing an economic framework similar to the *flourishing* one of the late Middle Ages society that Rushkoff described...

²⁷ Lietaer, 2001.

²⁸ Lietaer and Uanowicz *et al.*, 2010:13.

DYNDY ONTOLOGY OF MONEY & SCIENTIFIC BACKGROUND IN MONETARY ECONOMICS

In this second chapter, we take from philosophy and science some essential elements on knowledge and culture relating to our conventional and one-dimensional money system. In other words, these are the elements to take into account for a proactive adaptation to alternative forms of money. From an objectified to an instrumental and towards a relational ontology of money. Nearby, we link the reader to the most recent scientific breakthroughs demanding a structural change for the emergence of the future of money in the scenario of a G/Local multi-currency system. Since money can be seen as the projection of the collective unconscious of a society, it is necessary an external view for grasping its features which apparently everybody takes for granted without questioning them. And the lenses to wear for looking at the money taboo are, primarily, the ones of philosophy.

DYNDY ONTOLOGY OF MONEY

Money is neither an object nor a tool, it is a relation

Knowing what you count: Money as an Object

Men of business in England do not...like the currency question. They are perplexed to define accurately what money is: how to count they know, but what to count they do not know.

- Walter Bagehot

The commodity-exchange theory is perhaps the most representative account of the origin and nature of money in terms of an economic model based on “real analysis”, which centers on the relationship between demand and supply of goods and services (North, 2010). According to the proposers of the commodity-exchange theory dating back to the work of Austrian economist Karl Menger, money is understood as a medium of exchange, which arose in order to facilitate economic transactions otherwise impeded by what Adam Smith called the ‘difficulties of barter’. The latter is an argument rooted in both classical and neo-classical economics: for instance, A may want something that B has, but B might not want what A has to give in exchange, say swords for ploughs. If B owns a sword but s/he does not desire A’s plough, then there will be no double coincidence of wants. Therefore, the transaction will not take place until A will find what B wants in an often long series of intermediate transactions. In short, barter exchange does take place in a very narrowed set of situations, because the corollary to the argument of the ‘difficulties of barter’ is that a ‘double coincidence of wants’ is not the norm, but it is rather an exception in the dynamics of increasingly complex and growing economic systems.

The second element which contributed to the formulation of the commodity-exchange theory comes from the observation that a system based exclusively on barter is doomed to repeatedly break down because not all the commodities implemented as means of exchange are perfectly divisible, ductile, homogeneous and durable. In order to overcome such state of affairs, Marx stressed the necessity to use a ‘universally equivalent’ commodity, i.e. the commodity that “can buy all the others because it crystallized out into the money-form (Marx 1867).” Thus, classical economists paved the way to the formulation of the commodity-exchange theory by the next generations of economists. From a neo-classical perspective, the final end of this transaction process is the exchange of goods, which have an equivalent use value for both parties simultaneously, in view of bilateral utility maximization. According to the commodity exchange theory based on an objectified and commodified nature of money, men started to trade not only

commodities which had use value for them personally, but also commodities having greater marketability rather than one's preferred ones. Cattle is thus the first example of proper money under the assumptions of neo-classical economics, i.e. individualism, instrumentalism and equilibrium.

More in general, Menger unhappily stressed the neo-classical archetypal principle that naturally led humans to use commodities as money, namely the maximization of an agent's utility function:

“As each economizing individual becomes increasingly more aware of his economic interest, he is led by this interest, without any agreement, without legislative compulsion, and even without regard to the public interest, to give his commodities in exchange for other, more saleable, commodities, even if he does not need them for any immediate consumption purpose (Menger, 1871).”

According to the commodity-exchange theory, money does not seem to be the result of an agreement, its use is not enforced by law and it is not created by anybody for fostering the public interest. On the contrary, money is the result of the use of the most marketable commodities and, therefore, money ought to be basically an object man uses as a medium in order to facilitate exchanges while reducing transaction costs.

Now, from the point of view of the philosophy of science, Menger's account of the origin and nature of money is narrowed and weakened by the very set of assumptions onto which it is based: (1) methodological individualism that Menger derived from the rational utility-maximization model and (2) the retention of the model of an essentially barter exchange economy in which money is a commodity among others. From this mainstream perspective money is nothing but the standardization of bilateral barter: it can be a coin, paper money or a plastic smart-card, shark teeth, or still cowrie shells, depending on the historical and geographical set of reference. What matters is that such a commodified view on money does flatten out the nature of money on a singular dimension, i.e. the objectivistic (and philosophically superficial) dimension of the nature of money. Such conception of money corresponds in turn to a reification of the subjects using such commodified money with the ever pending risk to inter-subjectively refer among us to bodies rather than persons in our day-by-day socio-economic interactions.

How to address such state of affairs? The answer is...

Knowing what you count: Money as a Tool

The Origins of Money according to Orthodox Monetary Economics

Contrary to former orthodox literature, in the first book of the *Treatise* Keynes offers a systematic account of the origin and nature of money. In so doing, Keynes confutes the early neo-classical view centered on commodity money and the Quantity Theory, which, from Marshall in the U.K. to the Monetarists in the U.S., had spread as the mainstream monetary perspective in economics. In the foreword to the first edition, Keynes observes that there was neither a formal nor a systematic academic work about money yet and he filled such gap by publishing the *Treatise* in 1930 as a two volumes collection of information that he gathered through years of research. Rather than a satisfying elicitation of what money *is*, the result is a complete argumentation of what money *does* by virtue of stronger scientific proofs and a qualitatively better genealogy of the original emergence of money if compared to that one of Menger. Nevertheless, it is desirable to endorse Keynes functional analysis of money as a map for acquiring a systematic account of both nature and origins of money, in view of setting the pace toward a relational definition of the nature of money.

In the *Treatise*, Keynes endorsed a conception of money stemming from the Aristotelian tradition. Accordingly, money was not considered exclusively as a commodified object as under earlier neo-classical stances. If we were to consider money as essentially a universal means of exchange, then we would have emerged scarcely from the status of a barter economy. By contrast, in the functionalist view presented in Aristotle's work, money is thought of as an instrument, a tool, something which expresses itself *via* the deployment of its functions. Indeed, Rutherford argues that "as long ago as Aristotle in book V of his *Nicomachean Ethics*, the threefold functions of money as a unit of account, medium of exchange and store of value were noticed" (Rutherford, 2007).

Moreover, Keynes embraces stances of classical economists such as David Hume in that he endorses a functional definition of money as opposed to the objectified one. As Hume put it: "money is not properly speaking, one of the objects of commerce, but only an *instrument* which men have agreed upon to facilitate the exchange of one commodity for another. It is none of the wheels of trade: It is the oil which renders the motion of the wheels smooth and easy" (Hume, 1752). Nevertheless, today there are more comprehensive accounts of the functions of money: "money in classical economics is defined as (1) a medium of exchange, (2) a standard of value, (3) a unit of account, (4) a store of value, and (5) a standard of deferred payment" (Greco, 1994).

However, the primary importance of Keynes' contribution lies in this: he presented a hierarchical and tree-like account of the functions of money, with the unit of account as the top and most prominent one. Therefore, by virtue of new archeological findings, the Mengerian framework does lose soundness at least on the logical tier of the meta-theoretical structure of economics. Thereby, what is usually considered as an object is instead a concept that one can analyze by identifying its instrumental and multifaceted characteristics. Keynes' hierarchy of functions prescribes that money of account be the prominent element for a pure concept of money. Indeed, Lapavitsas asserts that "[money of account] is entirely abstract, an ideal construct of the mind, such as the legendary macoute. It establishes abstract accounting prices in the same way that other abstract magnitudes, such as meters and kilograms, establish abstract lengths and weights" (Lapavitsas, 2003).

In turn, money of account differs from *money itself*. The latter is "that by delivery of which debt contracts and price contracts are *discharged*, and in the shape of which a store of general purchasing

power is *held*" (Keynes, 1930). In this view, money itself can take different forms and each peculiar form may be developed in a corresponding theoretical ramification in economics: for example, the commodity form of money and the Quantity Theory derived from it or the store-of-value form and theories in favor of metallic standards. But the important point is that money itself is only the physical representation of a money of account, which is comprised in all the spectrum of the history of money: from sandstone money to electronic currency (Weatherford, 1997). Money of account thus differs from money itself because the latter is defined in terms of the former: "money of account is the description or title and the money [itself] is the *thing* which answers to the description. [...] If the thing can change [e.g. the commodity], whilst the description remains the same, then the distinction can be highly significant" (*Ibid.*).

True, money of account is the instrumental measure of value, which preceded coinage, the latter being the direct monetary evolution of commodity money emerged from barter economics: "it was not necessary, therefore, that the talents or shekels should be minted; it was sufficient that these units were State-created in the sense that it was the State which defined *what* weight and fineness of silver would, in the eyes of the law, satisfy a debt or a customary payment expressed in talents or shekels of silver" (Keynes, 1930).

With an undoubtable theoretical step forward in the explanation of the origins of money in general and modern bank money in particular, Keynes scientifically acknowledged the origin of money in the emergence of a money of account in Ancient Babylon. Keynes also stressed the continuity of such paradigmatic nature of money in its manifestations during modern times of State and bank money: "the first State reform of the standard of weight, of which we have definite record, was the Babylonian reform toward the end of the third Millennium BC. But this was not the beginning. Earlier standards existed" (*Ibid.*). Moreover, there is evidence dating back to such historical period of what Rutherford refers to as 'record-keeping', i.e. clay boards onto which there was recorded one's owed debt (Rutherford, 2007).

In particular, during the XX century archaeologists had catalogued almost one million *signed* clay boards coming from Mesopotamia and the curator of the Monetary Museum of Banca d'Italia, Odoardo Bulgarelli, had studied one representative set (Bulgarelli, 2001). Further, he did transcript and decoded them. In his historiographic research, Bulgarelli started from the Accad Empire (2335 – 2254 BC) and moved on until the Age of the Persian Empire (539 – 330 BC). He reached the conclusion that this lag there is an intentional continuity of implementation of the same type of money as debt throughout the centuries.

Ancient palatine economy is thus the center from which money of account - as we basically understand it still today - had emerged and started mediating human affairs²⁹. According to Ingham, in Ancient Babylon "the *shekel* [was] originally fixed at 1 *gur* (1.2 hectoliters of barley) and later at a more manageable 8.3 grams of silver. However, such Ancient societies were essentially non- monetized command economies with very small trade sectors. The overwhelming majority of payments were rents and taxes to religious and secular authorities" (Ingham, 2000). Hence, by contrast to the Mengerian interpretation the possibility to record debt and account for it through time in a secure way by virtue of calculus and script put the basis for the establishment of the most

²⁹ An alternative account on the origin and emergence of money of account is presented by American numismatist Phillip Grierson (1977) who argues for a similar contractual constitutive character for the emergence of money in the juridical practice of *wergel*, which was one of a range of institutions in early society that sanctioned payment of damages and compensation for injury and insult according to a fixed scale of tariffs (Ingham 2000): "Unless the commodities used for exchange bear some relation to a fixed standard, we are still dealing with barter [because] [t]he parties in barter-exchange are comparing their individual needs, not *values in the abstract* (Grierson 1977: 16–19. Italics in the original)".

fundamental element which distinguishes money from barter, namely the unit of account for measuring the value of wealth.

The Forms of Money according to Orthodox Monetary Economics

Money of account, "namely that in which debts and prices and general purchasing power are *expressed*", is the fundamental concept in a pure theory of money (Keynes, 1930). Indeed, Keynes stresses that contrary to both classical and early neo-classical conjectures that I presented above, "the age of money had succeeded the age of barter as soon as men had adopted a money of account": it is 'countability' that transforms the 'commodity', i.e. the medium of exchange into 'money' (*Ibid*). Since it is the most original form of money whose history is reliably documented, Keynes thus posed money as a unit of account on the top of the hierarchy of different forms of moneys.

In the first book of the *Treatise*, Keynes offers a detailed taxonomy of moneys, which begins by considering the two main categories descending from the money of account, namely money proper and bank money. Firstly, money proper is defined as "[that by] delivery of which [it is possible to] discharge the contract or the debt" (*Ibid*). Secondly, bank money is regarded as "the acknowledgment of a private debt, expressed in the money of account, which is used by passing from one hand to another, alternatively with money proper, to settle a transaction" (*Ibid*). A third category is 'representative money', a classification of money whose implementation had been reached as the "State claimed the right to declare what thing should answer as money to the current money of account" (*Ibid*). In this case, as Keynes argues, "the State may then use the chartalist prerogative to declare that the debt itself is an acceptable discharge of a liability. A particular kind of bank money is then transformed into money proper - a species of money proper which we may call representative money" (*Ibid*).

In the fourth section of the first book of the *Treatise*, Keynes elicits the forms that money can take depending on different contexts of both issuance and deployment. In this view, there are three different forms of money:

a) Commodity money: it is composed of "actual units of a particular freely obtainable, non-monopolized commodity [or warehouse warrants], which happens to have been chosen for the familiar purpose of money, but the supply of which is governed [by] scarcity and cost of production" (*Ibid*).

b) Fiat money: it is representative money "[now] generally made of paper except in the case of small denomination, [not] convertible by law into anything other than itself, and has not fixed value in term of an objective standard"⁴⁴. Another way to put it comes from Wray's account: "fiat money [is] determined by the quantity of commodities it can purchase" (Wray, 1998).

c) Managed money: similar to fiat money, [except] that it shall have a determined value in terms of an objective standard. Managed money is the most generalized form of money, which becomes commodity money "when the managing authority holds against it 100 per cent of the objective

standard" (*Ibid*). Alternatively, managed money may become fiat money when "it loses its objective standard"(*Ibid*)..

Keynes offers a useful scheme into which organize the taxonomy of money. I will reproduce it as a useful map of the different categories and forms of money as they are presented in the *Treatise*:

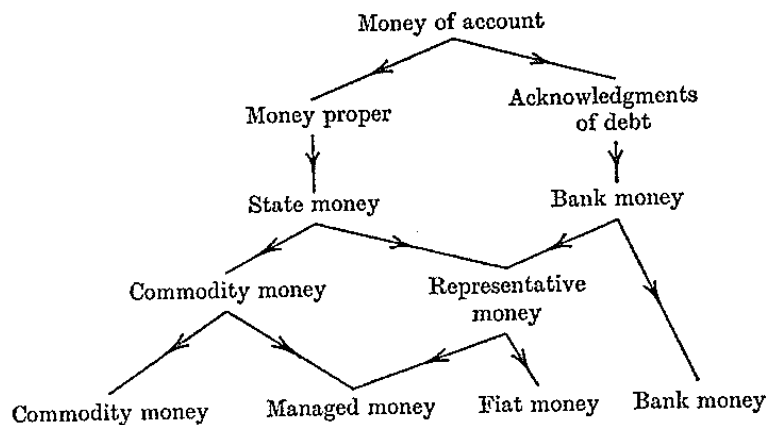


Figure 1: Keynes's scheme of conceptions and forms of moneys from money of account to the four main kinds of instruments of payment-exchange.

Keynes' scheme divides into two main categories, namely State and bank money respectively. According to Keynes, the aggregate of State money and bank money is labelled as 'current money'.

In particular, Keynes classified the latter as:

- 1) central bank money: "the state money hold by a central bank and constituting the State's 'reserves' against its deposits. These deposits are central bank money" (Keynes, 1930).
- 2) member bank money: "all central bank money is held by member banks. [This] central bank money plus the State money held by the member banks makes up the reserves of the member banks, which they hold against their deposits. These deposits constitute member bank money" (*Ibid*).

In such classification, member bank money together with State money (and central bank money) held by the public is the aggregate of 'current money' flowing into the conventional monetary system.

To sum up, on the one hand Keynes gives a more reliable explanation of the origin and nature of money - if compared to the neo-classical account - by recalling the first developments of money of account in Ancient Babylon. On the other, even the functional account that Keynes presented in the *Treatise* does *not* correspond to what DYNDY considers to be the correct conception of the nature of money. The reason is terminologically simple: to describe the nature of money through a definition of money's functions embedded in the narrow tenets of economics is not the same as defining what is the nature of money. In other words, if one answers to the question - What *does* money? - then s/he is not answering to the question -What *is* money?. Hence, instead of a instrumental account, the ontological question regarding money deserves an philosophical and relational answer. The answer will come from a semiotic genealogy of money applied within a relational ontology.

A Semiotic Genealogy of Money

The definition of the ontological origin of money - i.e. the answer to the question: what is the process which made emerge money into human affairs at a conceptual level? - is offered by a genealogy of the concept. On a genealogical level, the ontology of money is the result of a semiotic process. Indeed, in philosophical terms semiotics is a method from which it is possible to retrospectively infer the relational nature of "money" at the ontological level. According to Charles Sanders Peirce (Peirce, 1867 – 1893), logic is the most reliable method to employ for building a theory of knowledge³⁰ and a very informal definition of logic is the study of particular relations amongst symbols represented by signs³¹. In this view, semiotics is the general and continuous interpretative study of signs, which grounds the formulation of every conceivable theory of knowledge and, hence, of every scientific theory, i.e. monetary economics. In this framework, a sign, an object and an interpreter are strictly tight in a dynamic and triadic relation.

The scientific roots of such semiotic process in terms of the emergence of money as debt, *viz.* the process of interpretation of economic signs in monetary terms dates back to the period 2500 BC – 2000 BC in Mesopotamia, the age in which script and monetary instances as written registrations had emerged for the first time documented by historiography. Throughout such five- centuries lag, there had been in Mesopotamia the institutional foundation and consolidation of the city-state, which gave consistency to Temple Economy or Economy of the Palace together with the first episodes of debt crises³². At this very beginning script registers summarily debt on clay boards (names, seals, measures, quantities, products, etc). The clay board functions as 'memorial support': the exchange - or in other words - the transaction, leaves a mark that lasts in time as a reminder (see Figure 3.1). Moreover, the ministers of the temple are the "original repositories and depositories of the *public memory*"³³. The community of the city thus mirrors its faith on the priestly memory, which - before the introduction of the technology of script - consisted basically in oral mnemonics. However, the oral memory is not a sufficiently performing support for processing the expanding complex economic activity of accumulation and exchange: at this point there is scientific evidence of the first instances of economic written registrations in the form of money.



Figure 2: Cuneiform tablet featuring a tally of sheep and goats, from Tello, Southern Iraq.

What are the consequences of this translation from orality to script in relation to the development of money as we conceive it still today? The original transaction was a living operation carried out in the concrete time of action by means of utterances: the agricultural laborer goes to the temple and receives what he needs (seeds, tools for working, etc.) throughout the management of the

³⁰ I refer to Richard Rorty's notion of epistemology as in Rorty 1979, in particular Part II and Part III.

³¹ Rossella Fabbrichesi Leo, 1993.

³² Lincei's Publication, 2003. Bulgarelli, 2001. Sini, 2005: 91 – 100. It is noteworthy that there is scientific evidence to argue almost with certainty for the concomitant instantiation of money, interest-loans and correspondent debts as a consequence of a script-based accounting and managing monetary system.

³³ Sini, 2005.

ministry. It is obvious to both parties that, after the harvest, the farmer will deliver a part of it to the ministry for religious reasons. As productive economy grows, the temple becomes a big storehouse for foodstuffs, fodder, agricultural appliances, etc. In turn, ministries needed an efficient registration technology other than mere speech for managing increasingly complex accountability. Furthermore, the new and extraordinary multiplicity of transactions deserved a better “exchange mobility”, which was different from simple thing-to-thing barter (*Ibid.*).

There were at least two main problems: first, the necessity to register transactions and to fix the memory of the registration through time. Secondly, the necessity to translate goods and stocks under a common denominator, *viz.* the need to reduce their heterogeneity into a comparable homogeneity. In other words, there was not only the necessity to translate goods into quantity of value, but also to find the best technical solution in order to define a dependent variable, namely the quantity of debt. As a result, money as debt arose *de facto* through the thoughtful semiotic process enabling written registrations in order to solve practical problems while initiating – as each technology does through its interaction with the user – a still emerging history³⁴.

In a nutshell, as there is the possibility of writing, the entire transaction is synthetically registered: “Today, at the date X...the farmer Y...coming from the village Z...” and so on and so forth. Let’s check what happened in detail at a philosophical level. First the “present”, which until that moment was eternal in its unperceived and not measured (because not measurable) timelessness, is transferred throughout the registration from the action of exchange into a signed “trace”: such a trace is strictly speaking topographic, topologic and chrono-genetic³⁵. In fact, before the registration (on the *signed* clay board) there is not a precise place, an exact time and a definite time lag of the transaction. Now, script initiates a new semiotic scenario: from living action and generic speech, the transaction is now definable as a set of stable coordinates that are recoverable exactly in a predetermined future. But - more deeply - it is worth to underline this aspect: time *per se* in its linear flow (as we use to conceive it) is the result of a semiotic process possible by virtue of both handwriting and its being “subsequent” in character (*Ibid.*).

As historiography documents more concretely, the life of the farmer and of his community originally referred to a cyclic experience of time: the switch, alternation or – better for my argument – rotation of day and night, the rotation of seasons, the renewal of the year are suitable examples. However, since the translation of time from oral symbols into subsequent written signs, which register the “now” and forecast a precise moment of the future (which inescapably will arrive), there is the emergence of a new experience of time. Both the circularity of time and the eternal return of the present glide into the background of oral-memory: in fact, there is a semiotic over- imposition of both a horizontal and a linear wait onto the oral memory of the cyclic time³⁶.

The effects of this revolution trigger in turn further consequences. It is not a case that starting from 2500 BC cuneiform script develops to include phonetics in more and more precise syntactic configurations in view of becoming more and more reliable for the analytical registration of increasingly precise, flexible and subtle contractual details³⁷. What is staggering is the directly

³⁴ Marshall McLuhan (1967). As McLuhan claimed, the new medium encompasses the properties of the old one while enriching it until its complete metamorphosis into a more complex instance: script comprises phonetics, but it is a more powerful tool than speech.

³⁵ Sini, 2005.

³⁶ *Ibid.* In a same fashion, today linear time is being supplanted by real-time. At a semiotic level languages for software coding contain and concomitantly expand alphabetical scrip. And also the possibilities to conceive money are effectively affected.

³⁷ Lincei’s Publication, 2003.

proportional relation between enhanced “phonetization” of cuneiform script and extension of debt crises (*Ibid.*). In fact, there are two main factors that enabled and promoted debt: the enhancing and inexorable precision of written registrations and the qualitative and quantitative efficiency in the accumulation of food supplies. Those food supplies should save the farmer who is facing either a year of adverse weather or a year of famine: in fact, the loan from the temple instantly avoids farmers’ starvation. Nevertheless, the farmer takes out a loan and it could happen that subsequent difficulties or misfortune may make him unable to give the loan back by respecting the foreseen time as registered onto the clay boards. In this way a beneficial providence - the credit that loans provide - turns suddenly into an irreparable tragedy, namely, slavery.

Here, the first analytical observation is that monetary transactions constitutively present an important shortcoming: they are abstract as well as the script that register them. More precisely, the conceptualization of monetary transactions does not assign value to the living labour of the farmer and his contribution in creating food supplies through time; on the loan contract there is no mention of the farmer fatigue, his perseverance through years, his ability to face personal and familiar difficulties, etc. All these personal aspects stay out of the written loan contract, i.e. they are not performative in monetary terms, while they find expression in the oral memory, which is evanescent by definition: it vanishes as the sound of words does.

Nevertheless, the economy based on script is much more flexible and ductile in registering every detail and leaves fewer interpretative doubts when employed to establish quantities of debt and times of restitution. This is indeed script’s *raison d’être*. Moreover, if no debt were exactly and rigidly registered, how would it be possible to sustain the new complex economy? How could the new debt economy protect itself against laziness, negligence, frauds, which are all factor suitable for triggering decadence and misery at least in the long run? The technology of script supplies the means for the rising of monetary economy: the “phonetization” of cuneiform script enables to register new details in the loan contract by establishing additional conditions to those ruling traditional generic debt.

The objective and unquestionable truth of the ‘written’ is therefore in a relationship of dialectic opposition to the “symbolic” truth of the speech, the ‘unwritten’, which belongs to the tradition of oral history and gift economy. Letters and quasi-letters take the place of images and figures of speech. Nevertheless, written registrations concretely enabled the efficient and tidy management of an increasing number of units of production spread in increasingly vast territories. This leads to the institution of administrative bureaucracy and the consequent weakening of personal bonds and gages: in this kind of economy, administrative bureaucracy substitutes and mediates the relationship between both the King and the religious ministry respectively with citizens and followers³⁸.

Bureaucratic practice and mentality generate in turn the logic of the ‘institution’ with its pros and cons: on the one hand, there are high administrative efficiency and objective permanence of the institution’s interests; on the other, the cynic and cruel indifference to the concerns of personal destinies. Furthermore, the institution embodies *extra* personal truths, which are also universal and objective: the permanence of that which is written generates the “principle of non-contradiction” and in human affairs this principle begins to value more than the principle of solidarity and charity.

Moreover, the single individual has no allowance to violate the objective logic of the institution: for instance, the civil servant may feel a sense of genuine pity regarding the taxpayer in arrears, but this is not a good reason to induce him to breach the rules, because he *de facto* cannot do so. This

³⁸ Sini, 2005.

example shows the very root of legal sovereignty, which is superior to the king's will, even around money matters which are still enforced by law. Thus, the written contractual power, *viz.* economic power strictly speaking, overwhelms the social relations that the agents directly live.

The institutional power of money is thus contractual and it is in the contract that script shows its abstract power (*Ibid.*). It is easy to imagine the consequences that such an economic power - elicited and warranted by script - had on masses of have-nots and illiterate agricultural laborers: the power becomes *de facto* an instrument that triggers social instability. More subtle are the consequences regarding individuals belonging to the same social rank, i.e. the powers that be: ministries, high officials, nobles, royal court members – they are all individuals originally following the pecking order rules of reverential subordination and mores belonging to the deontology typical of a gift economy.

Now, the use of written contracts took the place of loans and similar agreements usually made by “taking word” for them, because the new form of transaction is more rewarding for the richest of the two contracting parties, esp. because the former imposes it to the latter³⁹. Strictly speaking, the quantity of information storable in the contract took the place of the quality that the interpersonal relations used to occupy at the core of economic activity⁴⁰. In this way, personal knowledge of the contracting parties and mutual self-esteem and trust became less and less important elements necessary for a desirable outcome of the transactions as it is common still today.

This is a consequence of the extension in time and space of the contract, which indeed take advantage of one among the peculiarities of script: it is possible to make an arrangement with somebody who is distant in space as well as it is possible to predict temporal consequences in the long run. The only necessary requisite is a medium of registration of quantitative data (space, time, quantity of commodities, quantity of measured value, etc.), namely money, and script is a suitable semiotic process to run for establishing detailed circumstances and objective loyalties. The public power of politics is grounded itself on script with the goal of assuring the cogent respect of such loyalties through law enforcement. As a result, in the long run the contract becomes a relation between strangers: it does not matter who are the contracting parties in their every day life nor where they come from and in general it does not matter anything that is not written in the contract. Only the transaction and the objective loyalties are the two elements that must stay equal through time: what is not in the contract does not even exist at least at the level of the objective and public truth kept by the monetary authority⁴¹.

More in general I claim that the adoption of both script and economy of money did instantiate the archetypical private individuals - those individuals that modern liberalism presupposes as obvious entities, absolute and eternal, *viz.* the archetype of the modern *Homo Oeconomicus*: these individuals are nothing but the first exemplars of private persons emerging in their comparison to the public and objective truth of an administrative bureaucracy. Hence, the use of money had been the catalyzer for the re-structuring of society by virtue of its own properties. Thus, through the semiotic genealogy of money that I elicited, I eventually showed how the semiotic features of script emerged at the original stage of civilization to mediate the economic relation between public institutions and individual agents. Indeed, script is an analytic practice: it registers debt by quantifying it. It does not *narrate* (telling) debt, but it does *rate* (accounting for) it. Therefore,

³⁹ Sini, 2005 and Lincei's Publication, 2003. See also Greco 1994, Ch. 4.

⁴⁰ The paradigmatic example is the shift from the Middle Ages civil market economy to the XVII century capital economy in Screpanti and Zamagni, 1993/[2005].

⁴¹ Sini, 2005.

written contract enables to register circumstances by isolating parts of the individual complex life and it petrifies, *viz.* hypostatizes them (*Ibid.*).

A good economic example to show the reader what I argue for comes again from the historiography of Mesopotamia between 2500 and 1500 BC: according to Bulgarelli, there is sufficient evidence for claiming scientifically that the introduction society of the written, circumstantial and forewarning contract in Mesopotamia meant the impossibility for the "rupture of the clay boards" (an act the King used to announce when planning a reset of debts to zero)⁴². Thereby, the most important consequence is that since 1600 BC a monetary debt may become irrevocable: the 'written' binds the voice to the 'unwritten', *viz.* to what is said: only what is 'said' in the event of the contract stipulation matters and nothing else⁴³. Indeed, it is a fact that since 1600 BC there is no evidence from historiography about edicts regarding debt amnesties (*Ibid.*).

Thus, the semiotic process that gave rise to the institutionalized habit of money as debt for the first documented time lasted substantially stable until today. Indeed, Marieke De Goede proposed a genealogy of finance, in which the latter is thought of as a "discursive domain made possible performative practices"⁴⁴. Such discursive domain mirrors in the financial world the philosophical tenets that I described by endorsing Peirce, Sini and Bulgarelli researches on semiotics and historiography. In my humble opinion, the same performative discursive practices developed by means of semiotics in written form brought about the inception and materialization of money as debt:

Illocutory Speech act (ISa) = instant action --> - Open the door!

Written act (Wa) = action extended in time --> "...the customer will repay the debt of \$100.000 to the Bank".

Legend: '=' - means - 'corresponds to an'
'-->' - means - 'for example'

Both (ISa) and (Wa) are performative instances of natural language, which is constitutively possible through semiotics. The example of Wa represents the common denominator between monetary economics and linguistics. 'Monetary performativity' is given by an inter-subjective shared convention bearing the contract effectiveness as well as the correspondent speech acts are rooted on inter-subjective sharing of linguistic habits.

Box 1: Performativity of speech act and written act in linguistics and monetary economics.

⁴² Bulgarelli, 2001.

⁴³ Sini, 2005.

⁴⁴ De Goede 2005. For the canonic account of the performativity of language (speech acts), refer to Austin 1962. Austin argues that 'to say' something is 'to do' something (performative utterances). In this perspective, the record of a debt on a clay-board is an illocutory act - an act that includes the concrete commitment to what is said (or written) - because the registration of the debt has a real effect on the economic reality of both lender (ministry of the temple) and borrower (farmer). Since the translation of the 'said' in the written form brings about the written contract, which - as well as the utterance - is illocutory, the former imposes an action to be accomplished within a certain time (repayment of one's debt). Thus, the semiotic process of scrip allows to record faithfully the utterance and therefore the speech act is projected in time on the clay-board support. The contract is concrete as it is the liability of the farmer. Indeed, either the scribe in Ancient Mesopotamia or the scrivener at the Bank of England in 1694 or still a clerk at a central bank today are performative actors: they literally create - in Austin's terminology 'do' - money in the form of a written 'promise to pay'.

Finally, understanding modern bank money as a performative practice suggests in accordance with classical pragmatism that "processes of knowledge and interpretation do not exist in addition to, or of secondary importance to, "real" material financial [and monetary] structures (e. g. the banking system), but are precisely *the way in which 'finance' [or modern bank money] materializes*"(*Ibid.*). Moreover, "it is not just the case then that financial knowledge - [and I will argue monetary knowledge] - is socially constructed, but the very *material structures* of financial markets - [and, I will argue, the very structure of the modern monetary system] - are discursively constituted and historically contingent" *Ibid.*).

Therefore, money as debt in general and modern bank money in particular are better thought of as *signs* of a performative practice of discourse, from which the concept germinated. As De Goede claims for finance, I will argue on the monetary level that the constitutive element of money is first of all "a particularly interpretative and *textual* practice. Money, credit, and capital are, quite literally, systems of writing. For instance, Mary Poovey argues that early modern bookkeeping, which forms the basis of current accountancy practices, was a rule-governed kind of writing and numbering that tended to *create* what it purported to describe. [Systems] of writing and numbering that made up bookkeeping not just actualized the categories it assumed to exist prior to economic reality but also disciplined and regulated economic agency and credibility" *Ibid.*). Is it not therefore the case to re-orientate the semiotic process at the basis of money's conceptualization in view of creating better performing monetary systems by virtue of embracing updated versions of script, e.g. languages from information technology? If modern bank money presents shortcomings, why do not formulate new discursive practices for critically developing monetary economics and avoiding periodical systemic failures?

What is that which you count? Money as a Relation of economic agreement

The semiotic process of discursively accounting-for-debts by means of a performative practice enabled by script through the translation of the 'said' into the 'written' leads to a more comprehensive philosophical understanding of the nature of money in general. Thereby, the ontology of money does not reside neither in the features of the objects that symbolize it (shells, silver bars, metal coins, paper banknotes, plastic credit cards, etc.) nor into those monetary functions it can be implemented for (unit of account, means of exchange store of value, etc.). Instead, the emergence of money at the ontological level is the result of an abstract formulation of value measurement, which is immaterial, conventional and inter-subjectively shared as semiotic processing and natural language are with regards to discourse *per se*. At the ontological level, money is thus not materially consistent.

Further, under the lens of sociology, money is the result of the social relation of credit (Lapavitsas, 2003), which connects all agents of a market economy at every scale one chooses: material features of the means of exchange are, therefore, of secondary importance while the primary element to consider is the underlying performative discursive interactions that substantiate the effective existence of the monetary system at the social level. Without social interactions and relations, i.e. without trust among economic agents and the warranty of law enforcement by authorities, the monetary system would simply cease to function and thus to exist. In economic terms, nobody would accept money and, eventually, the velocity of circulation would tend to zero. Social bonds and relations are therefore fundamental elements for explaining the ontological features of money.

Both semiotic analysis and sociological considerations are parts of the 'protective belt' around the core element of the ontology of money in general and modern bank money in particular. Hence, if money is not merely a commodified object or a neutral negotiable instrument that men adopted to facilitate barter, what is then money? According to Lietaer, at the ontological level, "money is an *agreement*, within a community to use something as a means of payment" (Lietaer, 2001). In particular, money as an agreement is a notion that enables to underline the relational ontology (Illiceto, 2008) of money itself by virtue of money's power to settle transactions and discard debts among economic actors and to link different economies by means of multilateral trade. An analysis of the definition's members is thus mandatory:

Agreement

At first, the ontology of money as an agreement may seem intuitively inconsistent. Indeed, at a glance it may seem misleading to consider as immaterial something such as money, which has a direct impact on concrete reality. However, it is the bias of an empirical perspective toward ontology to claim that the answer to the ontological question 'What is money?' be a concrete and material one or at least an instrumental one in order to be considered as real. By contrast, it is legitimate to consider the ontology of money as immaterial and abstract as agreements and contracts are by virtue of their relational nature. In particular, the ontology of money has not to be relegated to materiality, but it can comprise also relations mediated by material elements, i.e. the relation of credit mediated by loan contracts recorded on paper sheets and ledgers. For example, the traditional bill of exchange.

Under these respects, Lietaer claims that "money has much in common with other social contracts, such as political parties, nationality or marriage. These contracts are real, even if they exist only in the people's minds. The money agreement can be attained formally or informally, freely or coerced, consciously or unconsciously" (*Ibid.*). Indeed, without agreement the seller would not accept the money of the buyer, who in turn would be not able to purchase goods or services from the former. In a nutshell, there would be no commerce and money would be a mere symbol instead of a means of exchange. By contrast, the notion of agreement "captured the collective process in which a particular money becomes acceptable as a medium of exchange" (Lietaer 2010, personal communication).

A useful distinction helps to better isolate the notion of money as an agreement, namely the distinction between *fiat* money and mutual credit. According to Lietaer, the former is "a currency which is created out of nothing by an authority. For instance, all national currencies (including the Euro) are fiat currencies" (Lietaer, 2001). Further, *fiat* currencies bear interest, which is the "hidden mechanism [generating] competition instead of cooperation among participants" (*Ibid.*). In this case the agreement is enforced by law. Conversely, "mutual credit systems are simply a monetary formalization of the tradition of helping each other that is embedded in almost all traditional societies" (*Ibid.*) Thus, mutual credit currencies "encourage reciprocity and cooperation" (*Ibid.*): in this case the agreement is not enforced by law, but it "sometimes even spontaneously fuels a rebirth of a tradition of gift exchanges among neighbors" (*Ibid.*) Hence, if compared to fiat money the latter is an agreement which is based on a totally different set of values more consonant to the code of conduct of the aristocracy in Ancient Mesopotamia, whereas now it is thought of as a instrument for monetary democracy.

Community

Since the ontology of money resides in the philosophy of language, it is reasonable to endorse disciplines related to linguistics in order to better elucidate the factors operating in the working definition of money. For instance, in sociolinguistics a community is a group of people which share the same language (or sub-parts such as specific slangs, jargons and technical languages). Given the entanglement of language and the concept of money *via* semiotics, in a bank-money based monetary community, for example, everybody willing to be operative in economic terms needs to share the same set of beliefs about modern bank money with other members of the same community, i.e. the same 'confidence' to use the conventional means of payment as others do for settling the mutual discharge of debts. As Lietaer put it:

"Money as an agreement is valid only within a given *community*. Some currencies are operational only among a small group of friends (e. g. tokens used in card games), for certain time periods (e. g. t h e cigarette medium of exchange among frontline soldiers during World War II), or among the citizens of one particular nation (e. g. most 'normal' national currencies today). Such community can be the entire global community (as in the case of the US dollar by treaty, as long as it is accepted as reserve currency), or a geographically disparate group (such as Internet participants)" (Lietaer, 2001).

For instance, this is exactly what happens in the former European Economic Community, now European Community, the first pillar of the European Union: within the Eurozone economic agents share the same confidence in the European Monetary Union (EMU) based on the Euro, which derived from the creation of the European Currency Unit (ECU).

Means of payment

The working definition of money that Lietaer proposes does necessitate a terminological distinction between the expressions 'means of exchange' and 'means of payment'. As he put it: "note that the words 'means of payment' is used instead of the more traditional 'means of exchange'. The nuance is useful to be able to include transactions which have ritual or customary purposes, instead of just commercial exchanges. After all, it is only in Western culture that total priority has been given to commercial exchanges, neglecting other purposes of payment", for example marriage dues (*Ibid.*). Indeed, curator of the Department of Coins and Medals in the British Museum Jonathan Williams argues that the focus on commercial exchanges are peculiar of Westerners: "it is arguable that Western culture and its money systems, far from being 'normal', are actually an historical anomaly in their fixation on the commercial. If this is right, it would be an even greater mistake for Westerners to interpret other monetary systems as a more primitive version of their own" (Williamns, 1997).

In conclusion, semiotics, linguistics and sociological considerations offer a broader and interdisciplinary scope of analysis for a sound unfolding of money's ontology, which in turn brings about a new working definition of money: from an object in the ninetieth century to a tool in the twentieth, money is now ontologically thought of as a relational *ens*, namely - and roughly - the inter- subjective agreement in the adoption of a peculiar means of payment for processing economic activity in a definite system of payment. Such expanded scope of inquiry gives a new and more complete understanding of the nature of money in general, which will be useful in the following scientific analysis of structural solutions to those structural problems that the narrowed and eventually flawed understanding of the nature of modern bank money triggers in financial and economic environments.

DYNDY SCIENTIFIC BACKGROUND IN MONETARY ECONOMICS

Process Ecology: the lesson from Nature for assessing the Monetary System

“We now have scientific evidence that a structural fault is indeed involved in generating financial crashes”.

- Bernard Lietaer

Orthodox monetary economics impels a conception of modern bank money, which cogently shape – and adversely influence – the performance of the conventional monetary system. However, there is room for arguing in favor of solutions. In particular, modern bank money triggers system’s failures, i.e. banking and monetary crashes with increasing exponential frequency directly correlated to enhanced systemic efficiency (Lietaer, Ulanowicz, *et al.*, 2009 and 2010). At a glance, the solution may be identified with an organizational monetary shift. True, in monetary economic terms the shift is not only descriptive but also operational: there will be a different way to approach the study of money systems *per se*, which will be not based on epistemic metaphors of classical physics. Thereby, this will imply a modification in the approach to the configuration and management of the monetary system.

Now, the problem of orthodox monetary economics is to be identified with structural shortcomings that modern bank money carries out at a systemic level. Modern bank money is debt-based money, which has no intrinsic value in the current *fiat* money system. It is loaned out at interest, but the money necessary for the total repayment of the loan is not brought into existence in the first place. Therefore, in order to exit this mathematical flaw, it is necessary to develop a systemic assessment on the issue of modern bank money with a look from outside toward the organization of the monetary system as a whole. In other words, the problem is that the system is not sustainable at the structural level by virtue of a conception of money, which presents architectural flaws stemming from the peculiar empirical way in which it conceptually arose and practically endured throughout history.

The by-product of the semiotic process that discursively gave shape to conventional money as interest-bearing debt is a monetary system characterized by poor performance and structural instability. If the root problem is a discursive one, the solution may be offered by new textual practices emerging from semiotics. They will be as arbitrary as the past ones, but they will also perform potentially better in that they will derive from a more conscious cognizance of cause. In particular, a structural solution is what it is necessary for addressing systemic problems that modern bank money inherently brings about. Hence, rather than focusing on philosophy, semiotics or still linguistics, the study of complex flow systems applied to monetary systems is the exercise to perform in view of presenting monetary solutions at the economic level. In a nutshell, philosophy helped to arrive at a satisfying definition of the nature of money as well as theoretical ecology can offer improving insights relating to the structural level at which money operates. Findings at the systemic level will in turn enable to theorize and show a conception of money better tailored for the civilization of the twenty-first century.

Process ecology enables a paradigm shift from newtonian epistemology centered on the idea of an “eternally changeless universe”, which find expression in orthodox monetary economics through the never ending research of short-term systemic stability to that one of ecology with long- term

sustainability as the main goal: the meta-narrative shift is discursively about the analogy to deploy for the design of the monetary system. According to Lietaer,

“in ecosystems, as in economies, size is generally measured as the total volume of system throughput/ activity. Gross Domestic Product (GDP) measures size this way in economies and Total System Throughput (TST) does so in ecosystems. Many economists urge endless growth in size (GDP) because they assume that growth in size is a sufficient measure of health. GDP and TST, however, are both poor measures of sustainable viability because they ignore network structure. They cannot, for example, distinguish between a resilient economy and a bubble that is doomed to burst [!].” (Lietaer, Ulanowicz, *et al.*, 2010)

In fact, money is the most effective element for catalyzing productive processes, allocating resources and more in general enabling an organic working of the system as a single energetic entity. Under these respects, structural issues are what matter most. Unfortunately, the implementation of modern bank money brings about unintended side effects at a structural level. Thus, if one applies the framework of the theory of complex flow systems, i.e. process ecology for the interpretation of monetary, banking and financial systems, it is possible to predict that an exclusive focus on systemic efficiency will irremediably lead to the creation of the kind of boom-and-bust economy that the monopolistic implementation of modern bank money brings about. Indeed, low diversity of moneys is the catalyst for high efficiency at the expense of an optimal level of resilience. DYNDY, thusly, promotes a move toward reaching optimal levels of sustainability through the enhancement of systemic resilience by the implementation of agreements emerging from discursive practices other than the conventional ‘promise to pay’ at interest.

The Analogy with Process Ecology applied to Monetary Economics

The analogy between process ecology and monetary economics will give those required underpinnings for allowing a smooth monetary shift from a mature industry society to a new post-industrial one through the definition of new kinds of agreement, which will complement the conventional one. Monetary complementarity is in fact the first step toward an alternative monetary autonomy. Indeed, by the endorsement of newtonian physical determinism, industrial society stood on the assumption that the world is predictable and, therefore, information for its management has to be centrally administered by ‘experts’. By contrast, Lietaer argues that “in an era characterized by uncertainty it is necessary to consider the re-formulation of organizational assumptions.” (Lietaer, 2001) And, as for DYNDY approach, in the direction of a monetary system managed and organized by commoners (rather than experts).

In process ecology Total System Throughput quantifies in a single metric the throughput efficiency of a natural network of transfer of material and energy. In an analogous way, national Gross Domestic Product – the total value of goods produced and services provided in a country during one year – is the correlative element in economics. Indeed, orthodoxy prescribes exclusively quantitative measurements for assessing an economic system. Such state of affairs makes the system prone to poor performance with concerns toward systemic resilience and sustainability. Thus, on the one hand reality offers uncountable examples of natural ecosystems that have been successfully enduring in the long run with both efficiency and resilience steadily in the value range of the window of viability. On the other hand, artificial systems such as conventional monetary systems show simultaneously high efficiency, but very low levels of resilience because the latter is not included as a valuable parameter in orthodox monetary theory for systems design:

“GDP and TST, however, are both poor measures of sustainable viability because they ignore network structure. They cannot, for example, distinguish between a resilient economy and a bubble that is doomed to burst.” (Lietaer, Ulanowicz et al., 2010) The analogy is further developed by arguing that money “is to the real economy like biomass in an ecosystem”. (*Ibid.*)

However, speaking of an analogy is reductive. Indeed, by applying information theory to the study of ecosystems, there is the mathematical demonstration that monetary systems – in order to be sustainable – must mimic Nature’s parametric values relating to efficiency and resilience/interconnectivity. An exclusive focus on systemic efficiency will irremediably lead to the creation of the kind of boom-and-bust economy that the exclusive implementation of modern bank money brings about. In fact, the primary importance that orthodox economists accord to the efficiency of the monetary system is expressed also through the adoption of a single type of money, namely modern bank money in the form of conventional national currencies.

Accordingly, monetary orthodoxy focuses on the ‘node to node pathway steps’ of the network resembling the monetary system, while there is an underestimation of the importance to have the sufficient amount of ‘links per node’ for a sustainable complex flow system to obtain. The result is that low diversity of moneys is the catalyst for high efficiency at the expense of an optimal level of resilience. Thereby, the only rational movement is a backward one in the direction of more resilience in order to keep the system as whole steady in the range of the “window of viability”. At a glance, the term ‘backward’ may seem reactionary, but in our case the meaning of the term acquires a fully purposeful semantic: a move backward means firstly to take the pace toward reaching optimal levels of sustainability through the enhancement of systemic resilience by the implementation of agreements emerging from discursive practices other than the conventional one.

The Solution offered by the Analogy with Process Ecology: Alternative and Complementary Currencies

In the money creation process, the monopoly of a monoculture of national currencies frames a system, which is constitutively characterized by a significantly fragile structure. The eventual focus on the efficiency of the system in processing higher and higher volumes of national currencies toward necessary growth for increasing the size of total global trade has meant the total distraction from the care of those systemic parameters, which are necessary to safeguard a sustainable system. In other words, monetary economic orthodoxy fosters the development of ‘bonding capital’ through the adoption of a single type of money. Conversely, alternative and complementary currencies focus on the value and cultivation of ‘social capital’, which “[is] a form of capital based not on money but on relationships” (North, 2010).

For more efficiency triggers more brittleness than reducing it and since another monoculture of currencies will resemble the present systemic framework without improving it, what is therefore the parameter to take into account for correctly designing an alternative framework of the present monetary system? The answer is to increase systemic diversity: more diversity means “an increase in structural interconnectivity with the deployment of several types of currencies [put in circulation] among people and businesses to facilitate their exchanges, through the implementation of [community] and complementary currencies. [These] different types of currencies are called ‘complementary’ because they are designed to operate in parallel with, as complements to, conventional national moneys” (Lietaer, Ulanowicz et al., 2010).

Thus, the implementation of different types of currencies will change the structure of the monetary system and, by definition, such change will ameliorate the level of overall systemic resilience. This in turn will increase the sustainability of the monetary system. In a nutshell, the possibility to make more connections through the use of different types of currencies will enhance the potential capability of every economic agent to virtuously respond to unexpected or unpredicted systemic failures in the domain of modern bank money.

Therefore, alternative and complementary currencies are a monetary device for effectively reframing the structure of the monetary system. Indeed, they are negotiable instruments designed in order to facilitate trading by virtue of enhanced interconnectivity of the system as a whole, esp. in those situations in which the supply of conventional national currency is tight. Put it in another way, the possible implementations of alternative and complementary currencies is potentially equal to the all possible social interactions, which are measurable in terms of value.

The new narrative constructed on the assumption of process ecology allows a systemic re-framing by organizational means, which will re-structure the network that shapes the monetary system toward enhanced sustainability. Although it may be counter intuitive from an orthodox perspective devoted to a narrative descending from the epistemology of classical physics, a critical meta-theoretical shift leads to the observation that alternative and complementary currencies are a remarkable and desirable discursive improvement for monetary economics with regards to whole system's sustainability.

Ecology of Money

People who say it cannot be done should not interrupt those who are doing it.

- Jack Canfield and Mark Victor Hansen

An 'ecology of money' (Douthwaite, 1999) seeks the careful management of the conventional monetary system in a sustainable way both by mimicking natural ecosystems' structure and by adding new currencies through tailor-made discursive and textual practices: new agreements formulated in natural language and new performative ways to deal with transactions' management by means of computer language for software coding, respectively. As I stated above, money is an agreement and agreements are formulated through discourse. Therefore the study of language and discourse is central if one is to proficiently assess the nature of money and decide whether or not it is necessary to intervene for fixing the structure of the system into which money flows.

But what is the rationale for driving the development of new agreements in the form of alternative and complementary currencies? Indeed, The specific meaning of the expression 'ecology of money' emerges from the analysis of the two etymological components of the word 'ecology'. First, an ecology of money aims at introducing the notions of resilience and sustainability in the toolkit of orthodox monetary economists by endorsing the 'eco-' of the worldview of environmental ecology centered on sustainability as it nonetheless was the original meaning of such prefix in 'economics': 'eco-' derives from the Ancient Greek οἶκος (οἶκος) which means 'careful management of available resources'. Secondly, ecology is composed by a second component, namely '-logy'. The etymology of this second part of the word is logos (λόγος), which means 'discourse'.

Today, the shift is from a monetary system with a single type of currency to multi-currency systems that graft onto – as complements to – the former. In particular, at the eco-systemic level Lietaer stresses that "we need to support the introduction and expansion of three different kinds of

currencies alongside our national currencies: (1) an inflation-proof global complementary currency designed to stabilize the world economy; (2) business-to-business currencies designed to counteract the effects of conventional money shortages during periods of economic crises and contraction; and (3) community currencies that address a variety of social problems and strengthen the fabric of society” (www.lietaer.com).

In turn, DYNDY claims that an ecosystem of currencies is to be further developed, if one is willing to find structural solutions toward a more resilient and sustainable monetary system. Indeed, an ecosystem of currencies may obtain through the development of an ecology of money: “A vibrant diversity of [currencies] is more likely to protect us than a reliance on a single monetary monoculture that may fail” (North, 2010). As an on going conclusion, the main reasonable consequence for wise monetary economists is to adopt a hermeneutic perspective in order to decide which is the agreement to develop in view of taking care of the monetary system as a whole. Thereby, monetary economists ought to interpret messages relating to the state of the monetary system and – when it is the case – formulate new agreements, viz. new seminal senses describing money through discourse, semiotics and economics.



DYNDY POLITICS OF MONEY

In the need to learn how to agree-to-disagree, DYNDY politics of money is designed around the necessity to give a viable narrative for a monetary system that foster a bottom-up 'anthropo-genetic' model of human development (Marazzi, <http://bit.ly/16Bg7uE>). On a normative plan, money can be thought of as software for programming social behavior - also unconsciously performed by the majority of the users of the conventional system. DYNDY is poised to offer possibilities for a monetary version of the Autonomist re-appropriation of the means of production - not of goods and services as for the tradition of the XX century, but of the very means of issuance of money and the networks within which it flows. In this third and more brief chapter, we offer a sketch of one out of the many possible set of experimental configurations allowing for the issuance of currencies explicitly designed to give users a degree of autonomy from the constraints and conditioning of interest-bearing bank-debt money. The result is what can be seen as a seminal basis for an 'Autonomist Monetary Economics' in its political, juridical and monetary aspects.

Our Future, Our Money: the Design of Currency Systems

"The only way to learn is by doing. [The point is] to learn in order to realize goals that were previously considered as unimaginable".

-Michael Hardt and Antonio Negri.

Capitalism is ontologically (and almost economically) dead, thus we do not need the kind of transitory revolutions that characterized the relation of opposition between those who produce real value and those who simply invest capital for production to occur. Another transitory revolution would cause a temporary resurrection of capitalism: indeed, capitalism can exist only if something else, us – or the Multitude, continue to fight against it. By contrast, the singularities composing the Multitude should have the interest on putting their hands on the *dispositifs* of the State only for dismantling them. A better strategy is a non-reactionary exodus from capital towards a self sustaining, horizontally developed and cooperation-inducing G/Local multi-currency system.

There is the need for a revolutionary transition. What does this mean? Essentially, non-violent insurrection in terms of creating new types of currencies against that which has traditionally been called 'money power'. The latter must be directly anchored to the decisional process informing the institutionalization of a form of money system suitable for all and not just serving the private interest of a few. Since modern fiat money, or capital, has been historically determined, and since it is the global cause of the disease of our economies as a factor penalizing our personal well-being through scarcity, inflationary pressures, devaluation, perpetual interest-bearing debt and the like, it does make sense to look for criteria to adopt for the design of better performing currency systems. Thereby, we need different types of currencies to use and earn in direct relation to the full expression of our potential in the context of a multi-layer P2P network horizontally connecting agents who participate into the economy.

In digital currency design, at the light of the slightly poor performance of modern money (nowadays, the dollar does not even value the paper onto which is printed), the main goal is therefore to design alternative and better currencies apt to guarantee the preservation of biological material commons (e.g. access to water, assets for clean energy production, etc.) while promoting

the increase of biopolitical production of immaterial commons: codes, images, ideas, habits, knowledge and forms of life, which we can think of as 'alter-modern'. Currencies are to be invented in order to promote "biopolitical production, where labor is more and more responsible for the creation of cooperation [and] becomes more and more autonomous from the commands of capital". (Negri and Hardt, 2009)

Autonomy from behavioral pressures exerted on the public by modern bank money and cooperation between peer members of a horizontally developed economic network connecting the multitude are the assumptions to take into account when designing currency solutions for the exodus from traditional proprietary money: Bitcoin is a breakthrough in the juridical context of the property of money, now belonging to the miner or buyer, but not anymore legal propriety of a central issuing institution such the IMF, World Bank, BIS, FED, or still the ECB in terms of the European Stability Mechanism (hereafter, ESM). More in general, the conscious creation of currency systems for open P2P transactions is fundamental for what Negri and Hardt call "the institutional development of the forces of social cooperation (*Ibid.*)". In fact, the only way to make monetary, financial and banking crises like those we are experiencing nowadays a mistake of the past, we need to create a financially sustainable monetary system that will consider in its design features, the economic needs of all the population while giving at the same time the means of payment for maintaining and improving the commons.

Such framework instantiates itself when the singularities shaping the Multitude, i.e. us, stop to see institutions as a constituted power, but start to see them as a constituent power. DYNDY perspective on currency systems design takes this into account by considering the exodus from proprietary money as an asymptotic process towards the DIY-development of the necessary telematic infrastructures and social capabilities of the multitude to choose, learn and master a politically democratic and economically interconnected decisional process not based on traditional political representativity. If money can be the catalyzer of competitive behavior in a fiat-money world, it is also possible to design it to serve desirable interests of cooperative users inhabiting a different monetary world.

Thus, the disentanglement from the constraints of conventional money and the construction of an alternative way to deal with currency systems design are now two faces of the same coin: DYNDY strives for the bottom-up negotiation with the former coupled with the institution of the latter in an auto-catalytic process of mutual reinforcement. Starting to design new money systems by learning the lessons from nature and the past are two processes leading to the same result: giving people a way to constitutionalize the revolutionary process into a viable form of self-government through the help of currency systems designed to work for the Multitude. In order to reach such result, we need "the sustain of a constitutional, governmental and juridical structure" (*Ibid.*). Hence, in the process of currency system design, DYNDY endorses a "Rechtswollen, i.e. an institutional and constitutional willingness apt to articulate in parallel the singularities of the multitude together with the heterogeneity of its own instances of revolt and rebellion instructing a powerful and durable process. (*Ibid.*)"

Towards Money as a Common: the Digital-Coin Rule for a Free Society

“Of the many ways of organizing banking, the worst is the one we have today”.

- Mervin King

The issue around the nature of money is critical in present economic times. We are in a situation whereby the incapacity to re-define how we deal with money could resolve in an a severe damage to society as we commonly refer to it: contrary to what happens with information systems, there are no backups with money systems. Since the Internet revolution – and also as parts of national communities – we are almost unconsciously as well as coercively using national currencies. We either agree to pay with or are obliged to acquire something, which is not – by law – our own property: it is a fact that the legal owner of our money is the banking system. Central banks, commercial banks and international banking institutions are the legal entities literally in charge on economic and juridical levels. Indeed, as the recent draft of the ESM shows, such organs of society enjoy discretion, inviolability, immunity and almost total unaccountability to independent auditing authorities for each and every operation that they engage in.

What’s more, in the current bank-debt system where conventional national currencies flow, we find ourselves to be in a slightly uncomfortable juridical situation: we are citizens using exclusively national currency for the clearing of debts and the payment of taxes. Therefore, it can be of help here to seek solutions by borrowing a pattern from monetary theory, *viz.* The Neo-Chartalist approach in money systems design: since birth, we are locked into a one-dimensional monetary and fiscal system, where “That Which is Necessary to pay Taxes”, or TWINTOPT is issued, administered and enforced top-down (Wray, 1998).

As a consequence of the 2008 meltdown nation states are systematically increasing their public debts and, in order to do so, they ask new loans to central banks, the latter pretending some form of collateral for risk aversion purposes. The interesting part is that under current law, i.e. Maritime Admiralty Law, citizens are used as collateral: every time there is an increase in government indebtedness, taxpayers are obliged by law to agree to clear such expense through fiscal and monetary policies. Such rationale holds in every nation where central banking and the monopoly of a single type of currency are the normal monetary regimes. Since we are migrating toward a cashless society, to develop a cartography of the territory where monetary theory and policy and law cross with technology is of fundamental importance, if we are to avoid non-democratic and hyper-centralized regulation of the monetary system switching to the cyberspace.

The thesis about the Digital-Coin Rule for a Free Society takes the pace from philosophy of economics and technology both applied to draw the lines of the juridical innovation *via* a bottom-up direct vote by the population for the institutionalization of a transparent and open P2P G/Local multi-currency system. In such monetary network, different types of currency would constitute different lines of credit apt to relieve our and future generations from the burden of a staggering volume of debt, because the government would accept a diverse ecology of currencies in payment of taxes. With the political instrument of vote by referendum citizens will decide how to earn money and what types of currency to use in payment of taxes. By a democratic deliberation, it is possible to have back the property of money and to reform the license of money creation while ending the age of ever-growing debt. Currencies designed for environmental purposes, social

purpose currencies, B2B currencies, just to mention some non-conventional currencies already designed and in operation worldwide, will have legal tender power, i.e. they will be used in parallel with conventional money in the payment of taxes.

Thereby, central banking, commercial banking and the financial system would lose strategic monopolistic power while society will experience a P2P G/Local decentralized monetary system: from a new inflation-proof global reserve currency through re-designing conventional money (e.g. implementing full reserve banking) and an increase in Commercial Credit Circuits or C3 for the business sector, to alternative and complementary currencies for protecting local economies from external economic perturbations. In such scenario, 'peers' will be macro-economic regions, nations, businesses (from SMEs to big businesses), and individual persons, respectively.

All the peers belonging to a tier of the multi-currency system will operate in a P2P network where transactions will be transparent in a similar fashion with respect to how the Bitcoin's Blockchain works. In turn, a horizontal and a-centered framework will take the place of the vertical centralized one enforced today by current laws. This will open the possibility to institute an automated social, juridical and economic cyberspace where transaction fees will be drastically reduced since the role of third parties for clearing operations will decrease for transaction costs issues and efficiency reasons: even in this case Bitcoin is an exemplary pattern to implement for money systems designs. Finally, citizens will control their money more effectively than today and will be far less dependent from the competitive and exclusive marketplace in that they will not be anymore a mere form of collateral recorded on ledgers. By contrast, the Multitude will be free to cooperate in a system akin to Karl Polanyi's gift economy where money will be a public good, or better, a common.

Designing the Credit Commons: Autonomist Cooperative Direct Credit Clearing

The under performing state in which the global monetary system finds itself today invites to seek for more viable alternatives to perpetual repayment of compounded interest-bearing debt. The Credit Commons in the form of re-appropriation of the means of production / creation of money are the natural evolution to a post-capitalist economic system, and society. The goal is to democratize money by reverse-engineering the existent clearing system and eliminating the need for third parties while designing the system around users: from High Frequency trading to Optimal Frequency trading. Instead of 'private', Cooperative Corporations give the blueprint of a juridical form for the transformation into commons of the means of production of every good and service plus the networks that enable their exchange, namely monetary and payment systems.

Throughout the past few centuries the clearing process has been used by banks and conventional clearing houses continue to operate. The Ammers' *Dictionary of Business and Economics* defines a "clearing house" as "an association of commercial banks, brokerage houses, central banks or other institutions established to settle simultaneously the claims of its members to one another". For instance, the central bank is the clearing house of commercial banks, albeit price stability remains the primary function of a central bank. However, the process can be scaled to new financial scenarios. Direct Credit Clearing is not mere barter: "the clearing process may be applied among buyers and sellers of goods and services to directly offset their respective claims without the use of intervening banks or conventional currencies. In the clearing process each participant effectively pays into or takes out of a virtual "pool." [The] important point to understand is that in multiparty clearing what you owe to one party can be cleared or netted against what some other party owes to you." (Greco, 2009)

In *The End of Money and the Future of Civilization*, Thomas Greco stresses from a business oriented perspective that "ultimately it is your sales that pay for your purchases". In turn, from an Autonomist Monetary Economic point of view, other than sales, there is labour itself to pay for one's purchase of goods and services. What's more interesting for discovering a breakthrough and go beyond capitalism, he adds "Direct credit clearing makes the use of any third party credit instrument (money) unnecessary." The prospects for the organization of production and growth, together with those around the property of money, are very impressive: "A Credit Clearing Association based on an arrangement in which a group of traders, each of whom is both a buyer and a seller, agree to allocate to one another sufficient credit to facilitate their transactions among one another. The rest is merely bookkeeping. In such a system, the total amount of credit outstanding at any point in time can be thought of as the money supply within the system." (Greco, 2009)

For instance, in order to exit the present impasse, a nonprofit banking financial institution openly monitored by the public on a computer network with transparent audits could serve as desirable clearing house. By expanding the vision even further, in a P2P environment with a pretty autonomist background, this means that buyers and sellers would include entrepreneurs and workers in the same set, namely the set of peers, those who can buy and sell on a common platform in which there will be represented all the goods, services and commodities on dedicated indexes. Another achievement of such systemic organization for the monetary system would be the end for the necessity of endless exponential growth. Indeed, the consequences for the quantity theory of money would be that the 'money supply' "need not be an ever-increasing number. Conversely the quantity of money in the direct credit clearing system is "self-adjusting in accordance with the trading needs of the associated members, and does not play the same crucial role as in a commodity money system where the money supply is relatively inflexible." (*Ibid.*)

What about checks-and-balances? To help avoid unmanageable chaos and secure a steady economic system, it is important to refine two more structural factors:

1. Balance Limits: "the maximum line of credit on any account should be decided on the basis of the amount of that member's sales of goods and services [including labour] average over some recent time period."
2. Settlement: "to settle accounts, those who have negative balances would put enough cash to zero their account balances, while those with positive balances would draw out enough cash to bring their account balances to zero." (*Ibid.*) When visualizing the process with the conventional system and procedures eventually out of the picture, one starts to really appreciate Jonh Kenneth Galbraith once claiming that "The process by which banks create money is so simple that the mind is repelled" (Galbraith, 1975).

Moreover, Direct Credit Clearing makes the decoupling or exodus from the commercial banking system a question of functional efficiency of the new configuration: "While periodic cash settlement might be used initially to build confidence in credit clearing as a viable alternative payment method, even that degree of dependence on conventional money is not a functional necessity and should eventually be eliminated." (Greco, 2009) This will favor both autonomist and democratic features of the system. Finally, Direct Credit Clearing systems' design must provide strong authentication and surety of contract. In fact, the primary goal of a clearing system is to secure authentic *reciprocity* to all the members of the supply chain, from consumers / workers, to retailers / craftsmen, wholesalers, manufacturers, and the producers of basic commodities. To assure safety of contract, both collateralization of assets that set balances' limits and co-responsibility schemes in the form of 'self-help' or 'affinity groups' are sound design instruments of trust to implement.

To sum up with Greco: “A mutual credit clearing union can reclaim a part of the credit commons from monopoly control, enabling members to act independently of the banks in allocating their credit and conducting businesses and trading.” (Greco, 2009) The final step, Direct Credit Clearing in a P2P economic system, can “with relative ease be implemented at all levels to the economy, from the local to the global. [The] main obstacles that are likely to be encountered are political ones, as vested interests try to maintain their privilege and prevent the emergence of competition. It therefore behooves us to act quickly in the establishment and proliferation of alternative exchange mechanisms so that they will achieve widespread patronage and support sufficient to resist those attempts.” (*Ibid.*)

DYNDY APPROACH TO MONETARY POLICY

Lastly, we present DYNDY approach to tackle problems of monetary policy. After an effort in theorizing by means of philosophy, science and political economy, and aware of the present state of the global economy, DYNDY members and precious external contributors are producing papers on concrete solutions. In this last chapter, we have collected three pieces that give an idea about DYNDY interdisciplinary commitment and a related broader sense of monetary policy descending from it. First, a think piece by Marco Sacy on the Commercial Credit Circuit in Uruguay with a proposal to the United Nations Research Institute for Social Development. Secondly, an essay by Denis Roio on Bitcoin's political philosophy of technology. Finally, a most welcome contribution by Adam Arvidsson on the General Sentiment, presenting an articulation for a new approach to value in the information economy. These papers aim at offering an alternative and more desirable attitude toward money, the economy, and the singularities operating within it. They are not exhaustive, and more contributions are needed for building a steady narrative - but they give some significant orientations for solving monetary, banking and financial crises with the desirable use of state-of-the-art technology.





NGLS

The United Nations Non-Governmental Liaison Service

Working Paper 2013 (Draft)

The New Frontier in Payment Systems:
Virtual Currency Schemes, the C3 Uruguay case and the Potential Impact on SSE

*Marco Sachy,
University of Leicester School of Management*

Prepared for the special session on Alternative Finance and Complementary Currencies as part of the International Conference on Potential and Limits of Social and Solidarity Economy organized by UNRISD and ILO in cooperation with NGLS and other partners.

May 2013



The United Nations Non-Governmental Liaison Service

The UN Non-Governmental Liaison Service (NGLS) was established in 1975 by several UN agencies as an inter-agency programme to promote and develop constructive relations between the United Nations and civil society. NGLS aims at facilitating consistent and meaningful space for civil society participation in the intergovernmental deliberations at the UN. As part of this effort, NGLS tries to ensure that the perspectives of marginalized groups and underrepresented constituencies are better heard in processes of global governance.

NGLS, Palais des Nations
1211 Geneva 10, Switzerland

Tel: +41 (0)22 9172076
ngls@unctad.org
www.un-ngls.org

Copyright © United Nations Non-Governmental Liaison Service

This is not a formal NGLS publication. The responsibility for opinions expressed in signed studies rests solely with their author(s), and availability on the NGLS Web site (www.un-ngls.org) does not constitute an endorsement by NGLS of the opinions expressed in them. No publication or distribution of these papers is permitted without the prior authorization of the author(s), except for personal use.

* The special session is organized by the United Nations Non-Governmental Liaison Service (UN-NGLS), in cooperation with: UNRISD, ILO, Palmas Institute Europe, The Global Fund for Cities Development (FMDV), Institute for Leadership and Sustainability (IFLAS) of the University of Cumbria, Veblen Institute and the New Economics Foundation representing the European Union Interreg project: Community Currencies in Action (CCIA).

Table of Contents:

1 Introduction

2 The emerging VCS World and Cyclos

3 The Original Design of the C3-Uruguay: an Instance of the New Monetary Tools for SSE

4 The Shift to a Bottom-up Approach

5 Conclusive thoughts: institutionalize VCS such the C3

UNRISD_SSE_Conference_2013

Research Question (from Section 3 - Enabling SSE through public policy and the state)

Do governments have the institutional capacity and will to follow through on policy commitments?

- Abstract -

During the five years after the 2007 / 08 crisis, alternative forms to frame the economy, such as Social and Solidarity Economy (hereafter, SSE), are developing at robust pace in both the global North and South and this gives reasonable expectations to look for a change for a better performing economic system. Within SSE, complementary currencies - defined as agreements within a community to use something as a means of payment in parallel with conventional bank money - can exert a countercyclical effect on present recessive times (Lietaer, 2001). True, creativity and new and cheap technology allow today for an effective deployment of complementary currencies, which are designed to link unused resources and unmet needs in order to insulate (rather than isolate) a regional / national economy from global financial perturbations (Lietaer and Kennedy, 2012; and Thakara, 2005). Accordingly, issues such as tight credit, unemployment and the often structural antisocial dynamics of capitalism invite to endorse the principles of SSE and apply them as a set of values for the design of monetary mechanisms that can rewire an economy in concert with conventional monetary means (Euclides A. Mance, 2003). An eminently effective monetary innovation, the Commercial Credit Circuit or C3 has been conceptualized by Bernard Lietaer and it has been being on its way toward implementation for two years now by STRO (Social TRade Organization), a non-profit organization based in Utrecht and operating in Uruguay⁴⁵.

⁴⁵ STRO, 2009.

Our dilemma is that small design actions can have big effects—often unexpectedly—and designers have only recently been told, with the rest of us, how incredibly sensitive we need to be to the possible consequences of any design steps we take
John Thackara.

1 Introduction

Harris & Harris Group Professor at MIT Sloan School of Management Andrew Lo summarized the starting assumption from which I will define the leading perspective for the following think piece: “One of the most significant consequences of the Financial Crisis of 2007–2009 is the realization that the intellectual framework of economics and finance is incomplete in several respects.” (Lo, 2011:39). Indeed, after the crisis the international monetary system is still on the way of recovery through the implementation of conventional monetary, banking and financial policy instruments. The latter are demonstrating as poorly effective, esp. if one looks at the prospects for recovery within the productive parts of the economy, namely the SMEs sector which gives the greatest amount of jobs in advanced economies while decisively contributing to the growth of emerging ones. By contrast, we are today witnessing a prolonged recessive state of the business cycle with foreclosures and bankruptcies and the social problems they naturally beget.

However, the prognosis for the mid-term is in the form of more austerity measures justified by the need to keep credit tight and achieve deficit and inflation targeting benchmarks. Such policies impels further credit contraction with the impossibility to inject money where and when it is most needed. Thereby, both monetary orthodoxy and the exclusive implementation of modern bank money in the form of different negotiable instruments are the main catalysts for the ignition of Second Wave structural crises that we have been experiencing for the past few years, “through a ferocious circle making a victim of the real economy: Bad banking balance sheets => credit restrictions => recession => worse bank balance sheets => further credit restrictions and so the spiral downward goes” (Lietaer, *et al.*, 2009). In order to contrast such contractive trends of the money supply, the main instrument that orthodoxy offers is to bail-out banks at the expense of the average taxpayer (cf. the TARP Program in the US or the ESM in the EU).

Indeed, monetary authorities are responding to the crisis with the only way in which the dominant paradigm prescribes, i.e. after the crash, the system is being repeatedly re-inflated for building, this time, a sort of ‘debt bubble’:

“The irony is that, as soon as governments borrow these large sums from the financial system to save the system itself from bankruptcy, the financial system concludes that governments are now too indebted and need to be ‘disciplined’. [The] fiscal cost of bailing out the banking system is added to output losses with an automatic drop in tax income. Governments thus have no other option than to increase their indebtedness. This, in turn, results in the downgrading of the creditworthiness of affected countries and makes their debt more expensive. Where does all this lead to?”(Lietaer, Arnspenger *et al.*, 2012: 56)

This leads to an unsustainable fiscal pressure that will not be bearable in the mid- long-term. According to a study conducted by the Bank for International Settlements entitled *The Future of Public Debt: Prospects and Implications*, “fiscal problems confronting industrial economies are

bigger than suggested by official debt figures that show the implications of the financial crisis and recession for fiscal balances. [The] recent sharp rise in risk premiums on long-term bonds issued by several industrial countries suggests that markets no longer consider sovereign debt low-risk." (Cecchetti et. al., 2010: 16) And this becomes a problem, esp. in those countries whose economies simultaneously experience recessive downturns.

How is it possible that after what the IMF identified as a total of 425 systemic crises since 1970, i.e. the sum of banking (145), currency (208) and sovereign (72) crises - an average of 10 countries affected each year (Lietaer, Arnspenger et al., 2012) - the only solution by mainstream monetary theorists and policymakers is to repeat at a global scale, in substance, the same procedures that demonstrated as flawed for hundreds of times in the past few decades? The answer perhaps lies in what Lietaer and Arnspenger call a 'monetary blind spot' at the epistemic and methodological levels within the dominant monetary paradigm and affecting almost everybody. The metaphor of the monetary blind spot is particularly significant in that the human eye presents indeed 'a small portion of the visual field of each eye that corresponds to the position of the optic disk (also known as the optic nerve head) within the retina.' In the same way, our average awareness of the monetary paradigm in which we are immersed and that define almost every facet of our life, i.e. our 'sight', does not allow for a full acknowledgement of the structure of the paradigm itself and to appreciate the extent to which his modification could impact on one's socio-economic life.

According to Lietaer and Arnspenger, the phenomenon has three layers: first the "hegemony of single-currency thinking" that corresponds to the traditional monopolistic and top-down system of debt at interest, which accompanied humanity for the past few millennia (Graeber, 2009). Secondly, the ideological war between capitalism and communism: in this case the political antagonism funneled the attention of the masses on the political arena, rather than the monetary one. A usually understated datum that demonstrates this point is the fact that both the ideological wars between USA and Soviet Union in the twentieth century or that one between USA and China in the twenty first century see two countries that differed in everything but the monetary systems. In all cases the latter reflects the same blueprint as prescribed by the principles of central banking. Indeed, today representatives of the central banks of all these three countries meet regularly at the BIS for coordinating policies at the international level. Third, an institutionalized *status quo*, in which a professional tax bureaucracy can cause significant damage to the institutionalization of innovative monetary vehicles.

The very exit and solution to all these problems at once is attainable only with a sort of quantum leap in the evolution of our relation with money and the ways in which we can conceive them. In other words and in parallel with what happens in other dimension of the information society, ICT can be used for increasing the possibilities of communication of the medium of exchange of information about economic matters, roughly what we all mean by 'money'. What I claim from the outset is the necessity to adapt to change that all the sectors of the economy have experienced with the informatization of the productive processes has to follow also for socially sustainable practices promoted by monetary and financial innovations. For instance, the development of high frequency trading documents this in a free-market oriented fashion (Aldridge, 2010). As I will argue more in detail in the following, not only within orthodox monetary economics and finance, but also as a new set of tools for the enhancement of best SSE practices, currency design needs to be developed sustainably.

This is already possible thanks to a sort of stigmergic borrowing of software design principles for the innovation in the world of payment systems that are coming from efforts of the Complementary Currency Movement, which tangles instances such as the needs to insulate regional economies with new developments in ICT. As the Governor of the Bank of England, Sir Mervyn King stated in a speech in 1999, "the heirs of Bill Gates would have out the heirs of Alan

Greenspan out of business" (King, 1999 - quoted in *The Guardian* - <http://bit.ly/MBncya>). Indeed, King stated that "the digital age offers commercial parties to emit a digital means of payment backed by private financial arrangements" (*Ibid.*). In effect, signs of a paradigm shift in the monetary domain are more and more evident today and also central authorities cannot anymore ignore them: for example, The European Central Bank as produced a paper as for October 2012 with no juridical prescriptions on Virtual Currency Schemes (ECB, 2012) while the new regulatory 'guidance' for Virtual Currency Systems enacted in 2013 by the FINCeN (the US based Financial Crimes Enforcement Network - <http://1.usa.gov/YO16R3>) gives sings of a wish to charter the legal territory for these new types of money.

Within this sketchy scenario, I will now unfold the latest developments in the field with a particular attention to giving the reader a general overview on the main issues at stake while focusing on a peculiar case study whose features allow for a cross sectional analysis of the topics of interest for the audience at SSE conference. Indeed, by taking the pace from the Commercial Credit Circuit or C3 designed for the Uruguayan economy in the aftermath of the last financial crisis, I will touch upon the underlying technologies that allow for this alternative, or heterodox, approach to currency design and the advantages that they bring for the economies adopting them. In turn, I will present the bulk of problems relating to the implementation of the C3, in particular with an analysis deeply concerned to the structural difficulties that the new currencies impel more in general on the traditional systemic configuration of the monetary and economic system. Finally, I will present my vision on the steps to take for filling the gap between the present non-optimal systemic scenario to a more desirable one. In a nutshell, it makes sense to invest in the development of digital payment systems that can help communities to use the desirable aspects of the digitalization of money. Although they are still under-researched, Virtual Currency Schemes / Systems (hereafter VCS, interchangeably) are promising innovations that, if conscientiously designed, can give desirable outcomes to socio-economic contexts in which SSE is being implemented.

2 The emerging VCS World and STRO's (Social Trade Organization) Cyclos

Advantages of innovation in payment system technology in the form of Virtual Currency Systems beg the question of increasing the choices we have to deal with the transfer of economic value among parties in an economy. POS and card readers such as Square or iZettle, NFC (Near Field Communication technology), and IVR (Interactive Voice Response) are innovations that, if properly implemented, can increase the possibilities for realizing SSE precepts such as alleviate poverty, counteract recession, or still offset the scarcity of purchasing power in regional contexts. In general, VCS present the following features:

(1) They are technologies that can deliver a better tradeoff between effective transfer of value and transaction costs to achieve it. In a SSE perspective, this means banking the *unbankable* and increasing the access to financial services for enhancing the general level of Financial Inclusion. In particular, VCS accounts can be activated directly on the Internet, on mobile phone networks, or still by smart card. In any case, the cost of activation is fairly cheap. A VCS account also offers offline advantages when compared with a conventional bank account: less queuing and a better mobility (e.g. from 'faster' to 'closer'), together with a more efficient administrative control on the side of the payment system provider. All these elements contribute to enhance the degree of socio-economic sustainability in a way that goes beyond the mere access to money.

(2) As Marshall McLuhan would have noticed, the medium of communication through which economic value is exchanged influences the nature of the transaction itself and allows for new possibilities in currency design to manifest. According to the Bank of International Settlements, "once money is completely in the form of digital data, the possibilities to manage transactions and design currencies increase dramatically. In particular, different e-money schemes will vary according to their technical implementation, the institutional arrangements required to support them, the way in which value is transferred, the recording of transactions and the currency of denomination" (BIS, 1996). As the BIS admitted at the dawn of e-money design "electronic money is difficult to define because it blends particular technological and economic characteristics" (Basel Committee 1998). Thus, also digital money enjoys the most characteristic feature of money in general, i.e. the indeterminacy of money (Dodd, 1995) in that it leaves open a bigger and bigger space for innovative experimentation, esp. as VCS, whereby the currency acts only within a closed digital environment and does not have a direct link with conventional money.

(3) VCS can be designed in order to increase the Local Multiplier Effect in regions wherein a higher velocity of circulation of money is most needed, be that in a national economy or in a macro-regional one such as the European Union. Indeed, either the Uruguayan case study under examination in this think piece or the proposal for a *Geuro* for Greece on August 2012 goes exactly in this direction.

(4) VCS can be designed in order to lessen the burden of the costs of credit in a conditioned way: with conventional money, the costs of credit becomes part of the product's price while VCS allow for a redistribution of costs within the supply chain.

(5) The possibility to surgically condition the behaviour of currency flow within a VCS enable users to sustain and foster intra-systemic volumes of trade and this can generate additional sources of profits for the commercial sector together with an increased tax revenue for governments.

Too often, in the one-dimensional currency thinking of conventional monetary and banking orthodoxies, there is no space for theoretical and concrete / virtual innovation with ICT unless it is oriented to profit making interests. The shift, I will argue in the following sections, should conversely be toward the formalization of an exit strategy from the conventional paradigm imbued of market fundamentalism (Stiglitz, 2009). The issue is in turn of interest also for the operators of the monetary and financial system themselves, since the system is not insulated from the very shocks that it contributes to elicit as the fate of the "securitization food-chain" in subprime crisis has extensively taught (Morris, 2009). Today the main innovation in these respects is the fast prototyping of VCSs. A Virtual Currency "is a type of unregulated, digital money, which is issued and usually controlled by its developers, and used and accepted among the members of a specific virtual community." (ECB, 2012). Virtual Currencies are effective in achieving specific economic objectives, in opposition to what happens with the one-size-fits-all approach of authorities managing conventional money. The issuance is decentralized, and their ontology and legitimation might not be more than a series of contracts stipulating an obligation by a party to transfer value to another as for a pre-agreed set of juridical conditions. As King argued already in 1999: " ... the idea that two individuals engaged in a transaction could settle by a transfer of wealth from one electronic account to another in real time... Pre-agreed algorithm would determine which financial assets were sold by the purchaser of the good or service according to the value of the transaction". (King, 1999)

One instance of such pre-agreed algorithm is STRO's Cyclos (<http://project.cyclos.org>): it is an Open Source software for online banking purposes, in particular purposed for microfinance institutions, local banks - mostly in developing countries - and complementary currency systems. The new generation of VCS run on more sophisticated algorithms in comparison to software developed in the last decade: not only the new algorithms track and register transfers, but it is also possible to administrate, execute and deliver programs expressing monetary ruling of the system

in the form of fees and/or rewards. This allows for the conditioning of the flow of money in a more precise manner toward specific sectors or clusters of the targeted economy. In a SSE perspective, VCS can be designed for co-ordinating win-win solutions to all participants as the C3 system allows to do.

In a nutshell, VCS can increase the supply of the means of exchange. Further, they can re-shape the pattern of money's velocity of circulation for enhancing local economic activity by coupling the Local Multiplier Effect with the Plugging-the-Leaks approach: by focusing on the increase and concentration of transactions, viz. turnover, within a pre-established local economic area, it is possible to increase local output. This economic strategy is then mingled with a value system akin to SSE in that it prescribes the support of community members coupled with an approach to local and regional development that elicit a more sustainable impact of the targeted economy, if compared to the outreach of conventional monetary policy. Hence, through these means, VCS can become a new policy instrument designed to increase purchasing power in specific sectors or classes of the economy, or still counteracting unemployment, something that conventional money is *not* designed to do.

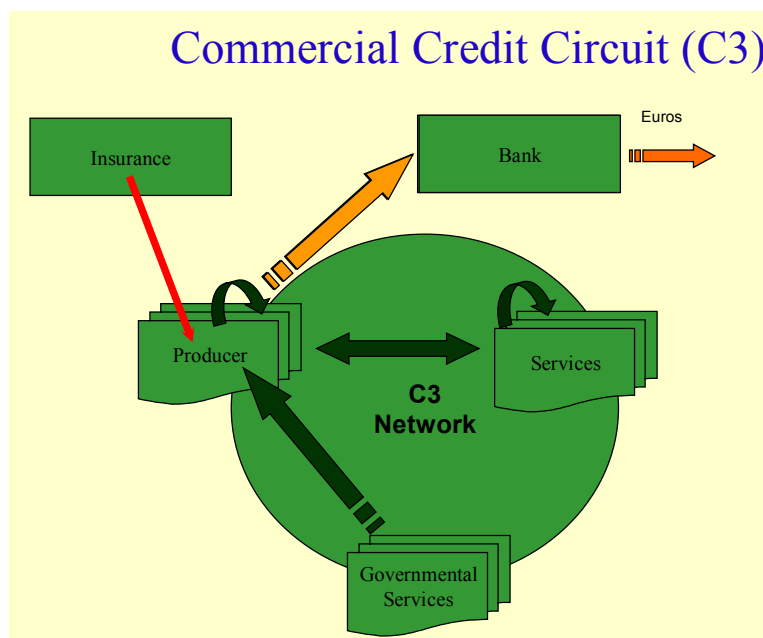
3 The Original Design of the C3-Uruguay: an Instance of the New Monetary Tools for SSE

According to Van Arkel, "some governments, such as the authorities in Uruguay, and some international organizations such as the Inter-American Development Bank (IADB), have looked upon the potentials of VCS as public policy tool in particular to promote employment and lower access to credit in relation to SMEs" (Van Arkel, 2013 – upcoming publication). Indeed, the C3 has been conceived as an innovative policy instrument for structurally addressing unemployment. In effect, the primary driving mechanism for the functioning of the conventional monetary system is fiat-money central banking. The booms and busts impelled by such systemic configuration drive economies toward full employment in booming periods, but then, during busts, they create significant unemployment. In contractive stages of the business cycle such as that one initiated with the credit crisis of 2008, at the microeconomic level C3 aims at creating more liquidity in the local market of SMEs.

Initially, the C3 has got its first recognition by the Uruguayan government as an instrument to stimulate credit for SME's that hardly have access to bank credit. The result of such stimulation of credit is the increase of local trade, especially for counteracting adverse market dynamics at upper economic scales, which tend to extract wealth from the territory without re-circulating it. Originally, according to a report from STRO, the main goal of the implementation of C3 in Uruguay was "to supply credit-worthy businesses with short term means of payment that serves as transaction capital and that does not depend on a monetary bank- loan and is thus cheaper and more readily available" (STRO Report, 2009). C3 credit-units are therefore a complementary currency, because they are a means of payment used by the Uruguayan SMEs community as credit for boosting the liquidity at their disposal. Moreover, C3 credit-units are designed in view of lessening the costs for the easing of loans when compared to those charged by the conventional banking system. The main outcome is a decrease in the national level of unemployment in force of a lower number of foreclosures and bankruptcies. The C3 Uruguay is one specific application of a Commercial Credit Circuit, in which the invoices of companies are being processed into a liquidity of claims on money. Last, the C3 Uruguay has been designed as an effective network aimed at complementing the conventional Uruguayan currency.

In the original layout of the Uruguayan C3, the credit-unit is in the form of Value Claims: "this means of payment can be rooted in a mix of backings, as long as there is an ultimate guarantee of a capable third party, such as trustable financial institutions, guarantee funds or credit insurances" (*Ibid.*). In the case in which an Uruguayan business company of small or medium size faces liquidity problems in terms of Pesos (\$, UYU), the firm will be allowed to get a line of commercial credit to spend within the C3 network. Such credit in the form of Value Claims is defined as "the right to obtain products from all other participating companies up till

a certain value" (*Ibid.*). For instance, if a business company obtains a credit of \$10,000, it will automatically have an account on the internet with \$10,000 in Value Claims to spend in the network. It is worth noticing that no tangible money circulates within the system. Thereby, Value Claims are theft-proof. Furthermore, the loan must be re-paid in conventional national currency. In turn, the money flowing in the C3 network is passed to the supplier of goods and services that "have a positive balance of Value Claims and are in need for money" (*Ibid.*):



The Dynamics of the C3 Network (graph courtesy of Bernard Lietaer in collaboration with STRO (2010))

The new agreement is such that Value Claims can be spent within the C3 network or exchanged for money. The result is as follows: depending on the financial situation that it is facing, a SME owning Value Claims can rely on at least two different options and such possibility of choice structurally enhance whole systemic resilience, because economic actors have a wider set of means of payment, which allows them to better cope with adverse financial situations. The compounded product is a more sustainable monetary system. In straightforward financial terms, if a member chooses to exchange Value Claims for conventional money, the only requirement for redeemability in national currency is that commercial credits must have been paid to the circuit. By contrast, if suppliers want to cash their Value Claims before maturity of commercial credits, they will have to pay a bank fee and associated interest costs for the period between the date of redemption and that one of Value Claims' effective maturity. In the case where a member becomes insolvent, suppliers owning Value Claims exchanged with the defaulted SME will receive the equivalent in conventional national currency from the insurance company or bank insuring the Value Claims previously loaned to such failing SME.

In order to effectively run all inputs from users, the system needs to use software with the capacities such as Cyclos presents. Cyclos tracks all the flow of Value Claims transacted among members of the C3 network. In particular, "[Cyclos] informs the system and its users of the amount of time the holders of positive balances will have to finance if they want to cash their Value Claims at a certain moment" (STRO Report 2009). The holder of Value Claims is thus informed in real time about the options that s/he is currently allowed to select for maximizing the performance of her/his business company. Holders of Value Claims can thus either choose to spend their Value Claims at face value within the C3 network, cash them now and pay the costs, or wait until the credits backing Value Claims are compensated with conventional cash and the national currency is hence freely available. The C3 network is therefore an organic framework with a very effective power to

structurally address the problem of unemployment by enriching the diversity of any single currency environment through the introduction of an *ad hoc* currency. In counter-cyclical terms, this is what has been accomplished by the introduction of WIR more than seventy years ago in Switzerland. However, C3 is a different network if compared to WIR: in the Uruguayan case there is the possibility to exchange one currency with the other - albeit at certain conditions. Moreover, Value Claims have also legal tender power and in principle the government have the role of constantly supporting the demand side by spending for services.

A series of benefits would be the main result of a *full* adoption of C3 for complementing the conventional monetary system of a currency zone that contains huge disparities like the Euro. First, the national monetary system would be structurally less brittle if compared with the traditional one resulting from the exclusive focus on the efficiency in processing conventional national currency (Lietaer, Ulanowicz, *et. al*, 2010). The shortcomings of the latter were indeed the main factor, which fostered systemic fragility in the form of monetary instability and concomitant credit tightness following the path prescribed by a Second Wave type crisis as I mentioned above. By contrast, C3 allows to increase total liquidity through the circulation of Value Claims in a defined area with underuse of capacities in companies and in terms of labor. The main result is a correspondent increase in the circulation of goods and services in the national market of SMEs with a direct relieving effect on unemployment.

Secondly, participating businesses would be able to strengthen their access to credit by means of the second currency, which is loaned at costs that are underneath conventional interest rates. Indeed, higher levels of liquidity in the form of Value Claims compel lower rates for accessing short time credit of conventional national currency. Therefore, SMEs could build on their working capital and maximize productivity. More in general for 'commercial credit', it is noteworthy that authors of a publication from STRO point out: "the C3 opens a way that allow buyers to pay immediately (within the circuit), regardless of the payment schedule in money, injecting substantial liquidity at very low cost in the entire SME network. So, while the buyer has postponed payment facilities, the seller meets immediate payment, as long as he can also spend within the network" (*Ibid.*).

Third, the government itself could experience advantages by full adoption of the complementary currency nearby conventional money. Thus, Value Claims would structurally allow governments at different levels (for instance, EU, national, regional) to "contribute to a guarantee mechanism. Such a guarantee mechanism is considerably cheaper to fund than subsidies or other traditional approaches to reduce unemployment" (*Ibid.*). Whereas subsidies may trigger distortions in market mechanics, C3 offers a counterbalancing mechanism for adverse market conditions. And this is true also at the fiscal level: the increase in the volume of trade significantly enhance tax revenues.

Fourth, C3 benefits also banks and the financial system at large, once SMEs become a profitable sector for banks which are used to profess the *credo* "bigger is more profitable". Further, "the credit lines are negotiated with the entire clearing network, providing the financial sector with automatic risk diversification among the participants in the network" (Lietaer and STRO, 2010). Therefore, more diversification means and increase in the sustainability of the system and this is of interest for every agent operating in the system. Moreover, banks can expand their portfolio of financial services with the inclusion of insured credit markets as the upper level of their set of products for SMEs and, eventually, microfinance.

Finally, C3 has *also* the potential to re-structure the European monetary system through a design that frames an economic win-win situation for all participants. The best scale onto which operate the network is certainly the regional one. From this main operational tier, the mechanics of the C3

network "systemically contributes to the stability of employment and of the entire economy, which is helpful for the overall solidity of the banks' portfolios" (*Ibid.*). Hence, complementary currencies are different agreements designed for specific monetary scenarios as the C3 documents. The leading principle is that when modern bank money structurally fails or is not satisfyingly operative, it is possible to restore a viable monetary system by adding complementary agreements. By virtue of the analogy with process ecology, I will conclusively argue that Value Claims flow in the C3 network as a ductile financial instrument whose implementation modifies systemic interconnectivity and, in turn, it desirably enhances the performance of the system as a whole.

The system is thus very flexible and variations are being tested in other South American countries. For instance, in El Salvador Groppa researched the barter-C3 *Punto Transacciones* which started a few years ago and it is focused on the SMEs sector (Groppa, 2012). In such research there are indications of the efficacy of a C3 to affect the inflow (creation) of purchasing power within the supply chain. Moreover, in Brazil, "for several years *Credimicro*, a microcredit organization based in Porto Alegre offered micro credits that were issued inside the local C3 CompRas (<http://instrodi.org/>) to test how these would run together. No formal research has been done, but from the daily facts InSTROdi, the Brazilian representative of the STRO-group, concluded that this approach would be feasible for any C3 that passed the 'chicken and egg' threshold, i.e. reaching the local critical mass for kicking-off the system." (*Ibid.*) However, The Fomento model that STRO implemented with Banco Palmas in Fortaleza, which contains both flows of local currency and national currency in a program for poor communities nowadays is promoted by the Central Bank of Brasil and the number of cities copying this Community Bank model now passed the 60.

4 The Shift to a Bottom-up Approach

In order to speed up implementation for the C3 Uruguay, STRO decided to partially change strategy: from the top-down approach fostered by public authorities to a bottom-up one for building momentum by involving *also* private actors. The first approach lately resulted in a growing number of welfare payments for food being transferred through a Cyclos-run payment system. This is being achieved at present through a "pilot with the provision of welfare payments for food with 500 people has been a success and the minister said that he would have it seen upgraded this year to 15.000 users (daily expenditures and weekly payments) Next year it is intended to grow to 50.000. (we do this together with Accor group for Ministry of Labor) Next will follow the program that allows tax free lunch remuneration that is run by Accor." (Van Arkel, March 2013 – personal communication). In the latter case, STRO is working on different sides of the Uruguayan economy, which are not entirely sympathetic with SSE principles and values. However, in my view STRO correctly proceeds with the types of resources at disposition, with specific projects that all run within Cyclos the small companies that are transporters of Coca Cola and Pilsner, restaurant tickets, taxi-payments, etc.

Hence, from a public policy tool that has the potential to increase the State's ability to foster SSE in the society at large without conflicting with traditional monetary policy, the C3 is now being implemented through a stronger participation of the private sector. The main negative consequence may be appreciated, if one looks at the issue from a fiscal perspective: from a virtual currency with legal tender power to a tax free digital voucher, the objective obsolescence of the bureaucratic system is the primary drawback for an advantageous structural change that could include SSE values in the toolkit of governmental policymakers. Indeed, to have C3 Value Claims equipped with legal tender powers would be desirable for all the players, esp. those who usually enjoy less negotiable power, i.e. SMEs - and the people running them in these critical times. In particular, by allowing for the anticipation of future income, Value Claims in the C3 network are an instrument that boosts co-operation among the actors inside an economy and this increases the

trust among members of the network thanks to belonging to a web of connections with like-minded peers. The latter indeed choose to respect pre-agreed monetary economic rules that have been designed for the advantage of all the members at once, rather than rewarding by default the most competitive at the expenses of more solidaristic economic relations.

Finally, the experience in Uruguay and new technologies developed in CompRaS are now being introduced in the Eurozone where cities, companies and other institutions in the regions of Catalonia, Sardinia and Bristol are joining a cooperation to make existing flows of money circulate more often into these communities in order to fight the effects of the crisis. Another spin off of the C3 activities in Uruguay was a conference held in April 2013 with high representatives of the welfare programs of Mexico, Brazil, Uruguay, Paraguay and Chile as well as the World Bank, CAF (Corporacion Andina de Fomento) and IADB that discussed pilots with C3 as a tool to improve the economic multiplier effect of the welfare payments into poor regions. Therefore, it is not an exaggeration to argue that although the original framework of both design and implementation saw changes for adaptability issues, such dynamic apparently strengthens and helps to institutionalize the model in other similar socio-economic scenarios.

5 Conclusive Thoughts: Institutionalize VCS such as the C3

As I roughly showed in the sections above, VCS in the form of C3 can be a very effective innovation for boosting the stances coming from SSE practitioners in collaboration with governmental authorities *and* without interfering with conventional monetary policy strategies. The complementary nature of the C3 documents this as a precise design choice: the C3 is a system that does not aim at competing with the conventional one, because it is designed to run in parallel with - as a complement to - the conventional monetary and economic systems or even to condition existing monetary flows in order to optimize their effects on regions or target groups. This is possible by virtue of design choices based upon SSE values and a pluralistic approach to the nature of money. True, conventional money is the only type of money that everybody is used to engage with. However, this does not necessarily mean that conventional money can serve for meeting all the needs of very diverse economies within the same currency zone. It is simply not designed to do so. Therefore, VCS implementations such as the C3 are instances of a new way to approach economic problems from a monetary perspective sensible to socio-economic issues.

By contrast, public authorities are not following the evolutionary steps demanded by the current Information Revolution in that they are *not* adapting quickly enough to change at the expenses of the socio-economy at large. The reasons for this are multifaceted and this is not the place for discussing them at least for obvious reasons of space. That said, it would still be desirable that policymakers acknowledged the necessity to re-orient their choices at the light of new findings from both pure academic research and payment systems' software development. Such a desirable acknowledgement may reveal as extremely advantageous for those who set the policy agenda together with those who have to follow it. What I conclusively argue for is, therefore, the urgent necessity to design *new governance structures* that both the public and the private sectors should encourage to make blossom in favor of the civil society. Indeed, by continuing to network with the Ministry of Labor's welfare payment program, while looking for a modular approach to bottom-up implementation of the circuit, STRO is showing high adaptability without a change in the nature of its commitment.

What's more, public authorities and central banks need to start to collaborate with the Complementary Currency Movement, since this would enable governments to enjoy the features of VCS without losing effectiveness of conventional monetary policy. In particular, VCS are able to

allow governments to influence the behavior of economic actors in ways that reinforce the local multiplier effect, thus increasing local economic activity. Indeed, by giving better economic infrastructures via VCS implementations, both governments and central banks can create positive externalities such as local employment opportunities, for example in the form of lower interest rates for cross-sectorial clusters of the economy. The only price to pay for such positive payoff is in the form of investments and cultural adaptation. The former may be probably found through lobbying and networking while the latter requires civic education and monetary literacy for society at large. These are, in my humble opinion, the ingredients for realizing full Financial Inclusion, esp. in peripheral regions of the G/Local economy everybody is immersed in. This shift is already underway, if one looks at the pluralistic new manifestations of money: Such variations of the theme around diversity of currencies will include the Complementary Currency Approach (Lietaer, 2001, 2010, 2012), Socialist Money (Lapavitsas, 2003), Direct Credit Clearing (Greco, 2009) and Commons Currencies (Quilligan, 2009), among many others.

Bitcoin, the end of the Taboo on Money

Denis Jaromil Roio, Planetary Collegium Ph.D. candidate, M-Node

6 April 2013, version 1.0

Abstract: Bitcoin is a decentralized system of digital authentication that facilitates the circulation of value on the Internet without the presence of any intermediaries, a characteristic that has often gained it the definition of “digital cash” or “crypto currency”, since it can be used as money for payments. This article consists in a technoetic inquiry into the origins of this technology and its evolution. This inquiry will take in consideration the biopolitical dynamics that govern the Bitcoin community as well specific characteristics of the technical realization, aiming to provide insights on the future of this technology as well a post-humanist interpretation of its emergence.

Keywords: Bitcoin, Crypto, Currency, Digital, Network, Community, Technoetic

Contents

1 Acknowledgments	2
2 Introduction	3
3 Origins	3
4 Memorable events	4
5 Innovation	5
5.1 Networked computing	5
5.2 Why mining	6
5.3 Accounting science	6
6 Community	8
7 Passion	10
8 Glory	12
9 Popularity	14
10 Conclusion	15
11 Contributor details	16
12 References	17

2 Introduction

The most powerful forces, those that interest us the most, are not in a specular and negative relation to modernity, to the contrary they move on transversal trajectories. On this basis we shouldn't conclude that they oppose everything that is modern and rational, but that are engaged in creating new forms of rationality and new forms of liberation.

Negri and Hardt, 2010, "Commonwealth"

This article doesn't aim to describe what Bitcoin is to the reader: there are several information sources that already accomplish that, starting from well designed video animations¹, vast numbers of press and academic articles listed on the wikipedia entry², and even a rather positive dramatization in an episode of the popular TV series "The Good Wife"³.

Rather than divulging the functionality of Bitcoin or its vulnerabilities, or even building an interpretation of it according to economic theories, this article investigates historical and philosophical aspects related to the emergence of this technology. In order to do so, the writer has been involved for more than two years within the Bitcoin community, engaging in both cooperative and critical exchanges with its peers.

Money is a fundamental medium upon which to build constituency and consolidate sovereignty. This research investigates the need for such a constituency, its urgency and emergence as a form of subjectivation. Ultimately this article provides a picture of the cultural context in which Bitcoin was grafted and has grown up to what it is now, offering keys to interpretation of its social and political aspects.

3 Origins

In 1994, almost two decades ago, a vast amount of time for the rythms of digital life, Steven Levy published in Wired an article titled "E-Money (That's What I Want)"⁴ with an introduction that left no doubts to the reader:

"The killer application for electronic networks isn't video-on-demand. It's going to hit you where it really matters - in your wallet. It's, not only going to revolutionize the Net, it will change the global economy."

For those who don't know Steven Levy, author of books like "Crypto" or "Hackers", let me just say that he is not the visionary type: his writings contain very little fantasy at all, and follow a journalistic approach in documenting the stories he investigates. In this article he voices the case of David Chaum "the bearded and ponytailed founder of DigiCash" who was working in Amsterdam to "catapult our currency system into the 21st century". In fact almost 20 years ago David Chaum was a researcher in the CWI, the national research institute for mathematics and computer science in the Netherlands, where in recent times I've had the honor to explain how Bitcoin functions⁵ in front of an audience of scientists that have worked with Chaum and, who honestly made me feel quite embarassed until I understood modesty is definitely one of their qualities.

Because I would like to start this article with an historical perspective, I can't help but track the origins of the evolution that Bitcoin represents into circumstances so well debunked in Levy's article, which once again was absolutely ahead of its time.

But that's not all. Bitcoin is not just "digital cash". Its birth and growth has been fostered by a network of trust that, to some degrees, shared ethical principles and the gestation of a constituency: I'm talking about hackers.

Bitcoin first appeared to the eyes of the hacker community in a Slashdot post⁶ which, on August 2010, announced the release of version 0.3. Previous to that, Bitcoin was only known on some minor cryptographer's mailinglist

¹Video introduction to Bitcoin "We Use Coins" <http://www.weusecoins.com>

²References for the Bitcoin entry on Wikipedia <http://en.wikipedia.org/wiki/Bitcoin#References>

³The Good Wife TV series on CBS, season 3 episode 13, recap: <http://blogs.wsj.com/speakeasy/2012/01/16/the-good-wife-season-3-episode-13-bitcoin-for-dummies-tv-recap/>

⁴Levy's article on Wired: <http://www.wired.com/wired/archive/2.12/emoney.html>

⁵Software Freedom Day, 2011, video recording online here: <http://www.youtube.com/watch?v=hdNRw-LWDUY>

⁶Slashdot post on <http://news.slashdot.org/story/10/07/11/1747245/Bitcoin-Releases-Version-03>

which as of today stopped to function. The post I'm mentioning announced the birth of a software that, through the distributed work of all on-line participants, would have created some unique "hashes" which could then be interchanged as "digital cash". Hackers at that time were already familiar with this concept as a similar implementation was circulating already for using a so called "hashcash" to fight spam online, basically putting a computational price on every email server willing to exchange emails. Also the distributed, or clustered architecture of this software sounded familiar, since many of us thought this would be some kind of SETI@Home, a software that distributed the computational work needed to analyze signals from outer space gathered by NASA observatories.

4 Memorable events

In two and a half years following the presentation to the hacker community at large, I'm individuating 2 memorable events that will help us understand Bitcoin's historical progression.

- January 2011 Wikileaks financial blockade
- 9 May 2011 Forbes publishes its first article on Bitcoin

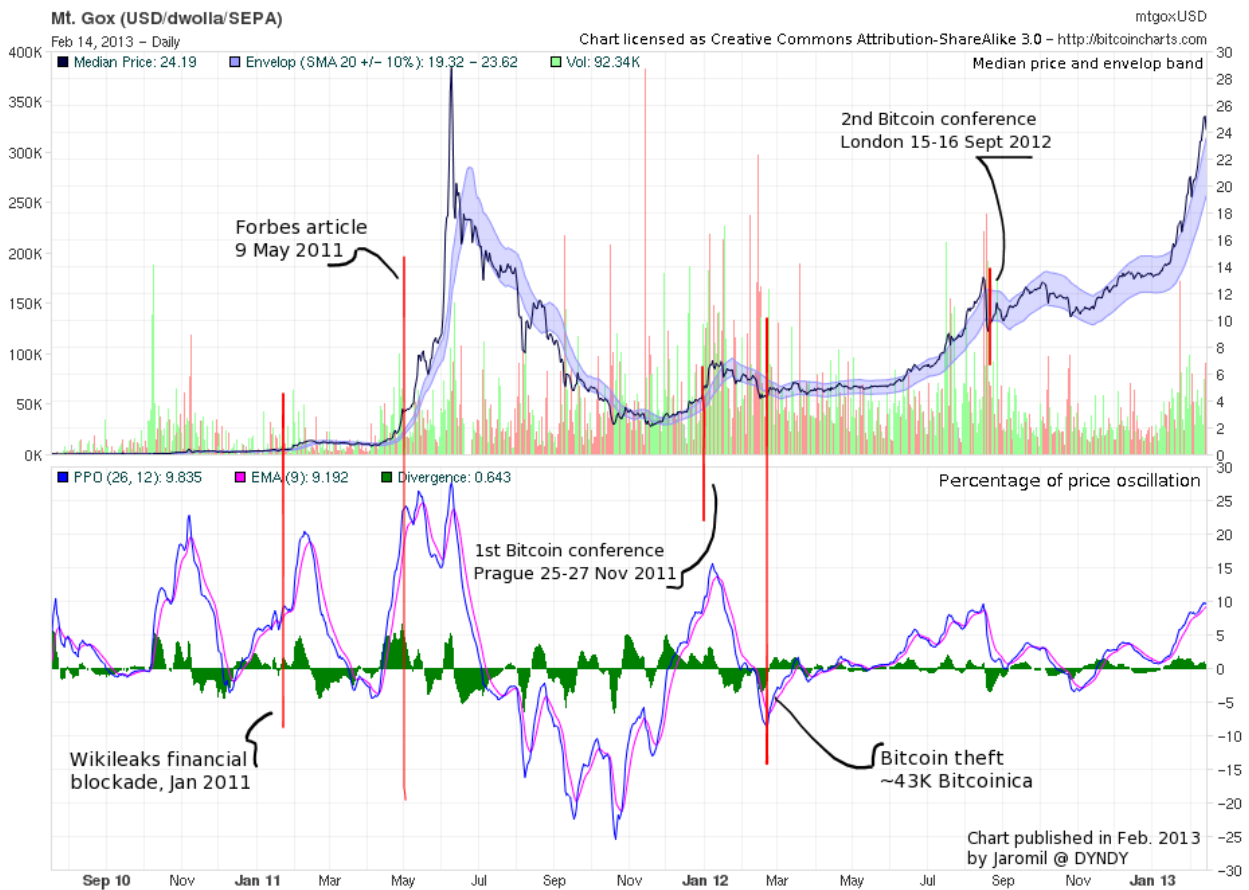


Figure 1: Price graph of memorable events

In *Figure 1* we overlap the chronology of these events to a graph showing the exchange rate of dollar vs Bitcoin on its biggest market "MtGox". The graph is doubled: above is the average exchange value and below is the

percentage of oscillation of the price. This graph helps to outline the influence that socially relevant events have on Bitcoin's financial values.

In the rest of this article I will refer to these two events, trying to explain the complex relationships that govern social and political aspects of Bitcoin. The chart in Figure 1 is probably as close as I'll get in linking such relationships to *financial phenomena*, because as abstract models of human action they have very little importance in my enquiry.

My ambition is to describe Bitcoin's technopolitical innovation without following universals - such universals as those populating most academic disciplined views in *economy*.

Hence, I declare the method of this analysis as *biopolitical*, in the sense that Michel Foucault gave to this word: the early genealogy of a new ethical sense, an enquiry into its gestation phase through the analysis of its processes of subjectivation. *This is Post-humanist Economics*.

5 Innovation

5.1 Networked computing

The physical property of symbols influences decisively the structure of the codes. It is influenced more by this than by the criterion of meaning. The structure of a message reflects the physical character of its symbols more than the structure of the universe it communicates. This explains the famous sentence "The medium is the message".

Vilém Flusser

First of all we need to better explain to the reader what networked computing actually is, a concept to which we'll also refer as clustering.

Clustering is a way to approach problems that are too big to be solved by a single computer, because for instance they require too much computation over a too wide range of data. Clustering a problem means to break it into smaller chunks and then to distribute these chunks to different computer units which all work towards the common goal, such that everyone does a part. It also means that those computers that have less to do, for instance because they are not used at certain moments, can autonomously offer their help to the cluster network that are a part of. One can imagine the situation in which, in a single room with 10 computers, only 5 are being used, those few users can benefit from a faster performance thanks to clustering.

This is no science-fiction, nor a brilliant new idea, although it has been never implemented on the consumer market, probably because it doesn't makes a profit for hardware or software manufacturers. Still, back in 2001, when we published the free operating system Dyne:bolic⁷, its clustering feature, implemented via the Linux kernel patch called OpenMosix, was one of the most appreciated by its users. The feature was announced with the slogan *El computador unido jamas sera' vencido* and it let people accelerate onerous tasks on slow computers (i.e. 3d renderings) by sharing the computational load amongst multiple machines: a perfect situation for grass-roots media-labs that have no money to buy computers and, rather than upgrading their hardware, tend to rely on the number of cheap units that they can recycle from the trash and donations.

The OpenMosix cluster implementation in Dyne:bolic is just an example of how networked computing relates to the economical and political aspects of digital societies. Out of the digital and back to the physical world, the mode of production and distribution of resources in networked computing is extremely relevant for the "energy grid" contemporary discourse.

Back to Bitcoin, while we individuate a clustering architecture in its implementation of a proof of work, we are still far from comprehending the real value that backs Bitcoins. In fact, the kind of work required to "mine" Bitcoins is very far from being connected to real life values: looking for particular numbers whose hashes start with 6 zeros, to make it simple, is nothing more than a quest for numbers.

We need to dig further than that to understand the sense of Bitcoin mining and dispel some legitimate doubts about it being a waste of energy. While its networked computing approach was appealing (hackers inherently love to "cluster things") it is hard to be immediately convinced about the real value of such an operation: only a

⁷The dyne:bolic GNU/Linux OS homepage is <http://www.dynebolic.org>

few initially understood why one should run such an algorithm to transform electricity and tech gear in somehow spendable numbers.

5.2 Why mining

Mining is the act of creating Bitcoins, basically the act of finding this “algorithmical mineral” and minting it into usable tokens. The process of mining is therefore remunerative for those who challenge it, by running the Bitcoin mining software on their computers. In simple terms, mining transforms electricity into Bitcoins: computers look for numbers that are not yet discovered and, once they found them, they can be relayed as coins within the network. Miners are generating the wealth, then they put it in circulation at their own discretion.

Back in March 2011, still a few months before the popularization of Bitcoin which unavoidably raised the level of noise for the discussion about it, netizen Mira Luna blogged on his/her journal “Trust is the Only Currency” what I believe to be the best criticism elaborated upon Bitcoin. I’ll quote here the conclusion of this blog post, titled “BitCoin: a Rube-Goldberg machine for buying electricity”⁸:

In the end, the artificial creation of the limited number of possible BitCoins via this "proof of work" (doing millions of SHA-256 hashes over and over) is madness. All you really need is to have "proof of limitation" without the politics—was the market restrained from creating too much money too fast? BitCoin's use of a procedural solution is the wrong track when all you need do is define a constraint via a formula and apply it as needed over time, instead of everyone continuously spinning a hash function and wasting electricity. Keep the transactions public, cryptographically sign them, and audit them with a money model and you'll be able to keep much of what is good about BitCoin. And of course, use a "commodity" the people can intuitively understand, something like... time.

To go further this criticism we need to explain what this *madness* is and why it can be considered instead an interesting innovation. When miners do their work (hence consuming electricity) Bitcoins “magically” appear, but their work also benefits the community: they strenghten the network of trust by making bitcoins less likely to be counterfeited.

The computation of mining and hence the electricity, is to strenghten the authentication of Bitcoin. Now let us consider the energy that was required, before the existance of Bitcoin, to authenticate the minting process of currency made in paper and less noble metals. It consists of a secret minting procedure, big machinery, a monumental building with thick walls and armed guards on its perimeter: an unstable kind of energy, very difficult to govern, as it relates to a *monopoly on violence* imposed by the sovereign state.

This very energy is substituted by Bitcoin with a qualitatively different approach: Bitcoin distributes peers to the task of building *trust in its authenticity*. The networked computation of all miners serves as a mint and dissolves the need for violence into an unlimited, unreachable and decentralized power.

Clustering the mint gathers the energy necessary to establish and protect the authenticity of the currency.

In other words: participation has substituted violence in the physical implementation of currency authentication: a recognizable pattern when we observe historical manifestations of the digital plane of immanence.

This passages leaves still open the problem of redistribution for the minted coins: it does not solve the problem of shared wealth. But we are now back to a familiar problem for money, after having dispelled the risk of a paradoxical machine, the Rube-Goldberg, which would have dissolved the Bitcoin’s concept of work in pure entropy.

5.3 Accounting science

The most remarkable innovation brought by Bitcoin deals with the system of accounting that we use today. Double-entry bookkeeping is what we use today to make sure that earnings and expenditures match, basically authenticating the flow of money and making sure “nothing is duplicated”.

From an historical perspective, the double-entry bookkeeping system is very ancient and barely actualised through the ages: it was described by an Italian mathematician and Franciscan friar named Luca Pacioli in his book “Summa de arithmetica, geometria, proportioni et proportionalità” published in 1494 in Venice. The second

⁸Blog article on <http://trustcurrency.blogspot.nl/2011/03/bitcoin-rube-goldberg-machine-for.html>



Figure 2: Friar Luca Pacioli (portrait by Jacopo de' Barbari, 1495)

half of his book, dedicated to geometry, is a section titled “Trattato de computi e delle scritture” in which he describes the necessity of mathematics in accountancy. Those principles were certainly not invented by Pacioli, but mostly actualised, formalised and translated in his tractatus, as demonstrated by the existence of a previous book “Della mercatura e del mercante perfetto” by Benedikt Kotruljević published in Latin some decades before, or as hinted by the presence of another figure behind his portrait in the famous painting attributed to Jacopo de' Barbari (Figure 2) who is believed to be Albrecht Dürer, an artist and traveler who shared Pacioli's passion for geometry and magic.

Such a system is still, as of today and despite its flaws, the one in use on large scale around the world by most accountancy systems. Being a system that ensures the univoque matching of what is written with what is real, it can be seen as gateway to the digital dimension and can undoubtedly benefit from the technical innovation through digital tools. Hence my argument that Bitcoin is basically this innovation or, more precisely, the implementation of an innovation as the *triple-signed receipt* method. Quoting Ian Grigg:

The digitally signed receipt, with the entire authorisation for a transaction, represents a dramatic challenge to double entry bookkeeping at least at the conceptual level. The cryptographic invention of the digital signature gives powerful evidentiary force to the receipt, and in practice reduces the accounting problem to one of the receipt's presence or its absence. This problem is solved by sharing the

records - each of the agents has a good copy. In some strict sense of relational database theory, double entry book keeping is now redundant.⁹

The accounting system of triple-signed receipts in Bitcoin respects the original role of money as contract (and digitized speech, I'd argue). Quoting Marco Sacy's research on complementary and alternative currency:

The ontology of money is as relational, abstract and cogent as agreements are in general and the possibilities to formulate these agreements are unimaginable, bearing in mind that the orthodox process of currency design and creation is - drawing from Adorno and Horkheimer's Dialectic of the Enlightenment - an arbitrary and historically determined one.

It is the very substance of those *cogent agreements* that money represents and can be verified by matching declarations on two books or, as Bitcoin does, calling the whole network of participating peers to witness every contract and entangling it into a cryptographic blockchain. Simply put, this is bookkeeping in the age of Bitcoin.

6 Community

At the core... is the idea that people should design for themselves their own houses, streets and communities. This idea... comes simply from the observation that most of the wonderful places of the world were not made by architects but by the people.

Christopher Alexander

When talking about Bitcoin, of its inherent qualities of networked creation of value that were just mentioned, we can't ignore the fact that this technology relies on community dynamics to the point one could state that Bitcoin makes it possible for *money to become a common* and no longer a top-down convention imposed by a sovereign and its liturgy of power.

But then we are faced by a crucial question about Bitcoin: what for? who benefits from it? or, in other words, if the community aspect of Bitcoin is crucial (as in: distributing the computation needed for its authentication, sharing a common currency, a common history of transactions, a common way to quantify wealth) what do the communities use Bitcoin for?

The earliest communities that adopted Bitcoin, aside from the hacker community that never really used it much as a currency to exchange goods, are perfect scapegoats for those who want to turn Bitcoin down. In fact, anyone willing to take a moralistic approach and prohibit the innovation that we are talking about doesn't even need to approach itching concepts such as state sovereignty. It is very easy for witch-hunters to emphasize the fact that drugs were bought and sold with Bitcoins, that gamblers love Bitcoins and that some website claims to accept Bitcoin payments for assassination missions. Criminalizing campaigns have been overly present in the mainstream media coverage immediately following the popularization of Bitcoin, in Italy we've seen even popular prophets of Internet optimism turning against Bitcoin in the blink of an eye¹⁰.

But then, speaking about new technologies, we should never rush to judge their nature and goals from their early adoption. It is natural that those who were excluded from the use of established technologies will look for new as yet unregulated platforms: pioneers at the margins are always attentive about the concrete possibilities of liberation offered by new and unknown tech. When speaking of communication technologies this becomes very clear: all kinds of marginalized and criminalized communities resort to lesser known channels of communication for their needs, while mass communication channels are well policed and in general dominated by the sanitized discourse of the conformed majority. The motivation to debate what moves prohibitionists in their crusade is far from this article, yet what needs to be stated here is that the potential of new tech cannot be studied, understood and judged referring to such circumstances. The examples provided on the early adoption of Bitcoin are in fact misleading to obtain a balanced comprehension of this tech.

The fact is that many hackers love to tease and this attitude, united with a discrete amount of criminals that found it convenient to use Bitcoin since the early phases of its popularization, still offer grounds for the mystification of it as an "evil technology".

⁹Grigg, 2005 - http://iang.org/papers/triple_entry.html

¹⁰People like Riccardo Luna for instance, a televised advocate of Internet and digital innovation in Italy, started a media crusade against what he calls the "Dark web"

Being involved in the community that has grown around Bitcoin I can see that the community is comprised primarily of young idealists rebelling against the status-quo, especially when it consists of a centralized administration prone to corruption. It is clear to many how unjust monopolies are often dominating various contexts, curbing the possibilities of innovation that are in the hands of younger generations. The liberation of the medium of value exchange is an act we refer to as “breaking the Taboo on Money”. Bitcoin has a role in history: its epos coalesces in communities, new ethical reflections, new tales of passion, the glory in all the mystery around its origins. The will for liberation, decentralization and disintermediation is central to Bitcoin - it is ethical and should not be seen as more conflictual than the concrete need to disintermediate many of the systemic functions that are governing modern society. Mind your own long-tailed problems, modern finance!

Many see in Bitcoin the opportunity to challenge the bank monopoly on value transactions. Most goods that were first exchanged on-line for Bitcoins, beyond the dark waters, digital or not, are artisanal creations. The Bitcoin dream is the autonomy of content producers, to exchange their production freely, without aggregations, without intermediaries. After all, most financial transaction operators know well that the reason that small artisans cannot enter on-line markets are the high marginal costs they need to face if they want to accept on-line payments, while the apparata that are able to negotiate trust with banks are imposing themselves as taxing intermediaries.

As a concrete yet slanted hint to the reader, he is my little protest against the **capitalism of flows**, an informal text that I’ve posted on the Nettime discussion list back in April 2011, slightly before the popularization of Bitcoin in the Forbes article published in May. While responding to early criticism of Bitcoin, this letter ended up being circulated on the Bitcoin forum and as the “Bitcoin Manifesto”, gathering approval from different members of the community¹¹:

On Thu, 07 Apr 2011, a...@aharonic.net wrote:

> bitcoins - isn't this simply a distributed structure to do capitalism with?

That's not even the worst you can do with it. you can do money laundering, buy drugs online and sex toys, all anonymously. but that's not the point, because despite the coercion imposed by all kinds of regulatory systems so far, also current official monetary systems are full of that shit, on top of the capitalist pie.

Emerging technologies should never be judged by the sensationally bad taste of early adopters. it's like being concerned about the shit that fertilizes some beautiful flowers, wasting their seeds.

What bitcoin really is, I finally understood on the 6 april (which somehow always ends up being a magic day, eh!): this is now the end of the **flow capitalism**, which consists of the monopoly on transactions, the hegemony of banks on the movement of values and not just their storage, this middle-man mafia strangling the world as we speak.

How right are those South American countries asking for the “taxation of transactions”, an argument refrained in many speeches of the *compañeros*. They studied the system and understood that there is a crucial problem, that needs to be solved urgently. Yet I'd argue that taxation on transactions cannot be the solution. The solution is to eliminate the flow capitalists.

If I want to give you money I'll give it to you. Me and you, period. Its fine that we'll pay our taxes for our communities, don't get me wrong this is not a tea bagger argument. Its just not right that all what we do is in the hands of a third party that has already been caught cheating many times: look at what happened at the Paypal accounts of the Iraqi Linux user group back in 2004, or even more recently to Wikileaks.

We don't need those fat cheaters to be in between our value transactions anymore; the flow capital has played its disgusting role in the little laps of history for which it has been needed, now sadly these people won't give up what they have accumulated, so it makes more sense to leave them alone and multiply more monetary systems that work efficiently across diverse networks and that rely on the neutrality of a cryptographic authentication.

The death of the flow capital is a new stage for the necrotization of capitalism.

¹¹Bitcoin forum thread “Bitcoin Manifesto” on <https://bitcointalk.org/index.php?topic=5671.0>

Beyond the shouted points made in this little speech lies an important hint: *Bitcoin will be of central importance for migrant economies.*

Today it is easy to witness the existence of large communities that are displaced around the world in the desperate attempt to recuperate over the territorial differential of value for their labour. Many of those who work abroad are sending money back to their families and communicating constantly with them, a natural phenomenon by which the market of telephone and money transfer shops all over the world flourish. These nodes of communication are extremely important for migrants, who can't live without them and most of the time end up being harshly taxed for their use. Monopolies like that of Moneygram or Western Union claim that no commission is applied to transactions, but their de-facto currency rates sometimes hide up to 20% for their profit.

Such profit on transactions is made upon data transfer that is comparable to that of a telephone call and it is not a coincidence that such shops often offer both services. Today there is no reason why such market of digital transaction shouldn't be freed in a fashion similar to what Voice over IP did for telephone monopolies. This is an old vector of evolution offered by the digital dimension and its progressive interaction with reality, that I call *digital immanence*: yet another scheme based on the artificial economy of scarcity is trembling!

7 Passion

Previously I've mentioned that Bitcoin's epos coalesces in new tales of passion.

For every process of subjectivity emerging in history, passion is crucial. Analyses such as the one conducted by Giorgio Agamben in his enquiry on sovereignty and glory show that it was historically possible to codify passion (and its mysteries) into power. Through the analysis of the ancient codes constituting laws and ethics (while also celebrating the glory of angels), Agamben shows that the power (and mystery) of passion is close to that of economy and its birth.

```

---BEGIN TRIBUTE---
#./BitLen
::::::::::::::::::::
::::::::::::::::::::
:::.' ' ' ' ' :
:::.' ' ,xiW,"4x, ''
: ,dWWWXXXXXi,4WX,
' dWWWXXXX7" 'X,
  1WWWXX7  __ _ X
:WWWXX7 ,xXX7' "^^X
1WWWX7, _.+,, _.+.,
:WWW7,. ^"-", ^-
  WW",X: X,
  "7^^X1.  _(_x7'
  l (:X:  __ _
  ' . " XX ,xxWWWXX7
  )X- "" 4X" .____.
,W X :Xi _ ,_
WW X 4XiyXWWXd
"" ,, 4XWWWXX
, R7X, "447^
R, "4RXk, _ ,
TWk "4RXXi, X',x
1TWk, "4RRR7' 4 XH
:lWWWk, ^" '4
::TTXWwi,_ X11 :..
=====
LEN "rabbi" SASSAMA
1980-2011

Len was our friend.
A brilliant mind,
a kind soul, and
a devious schemer;
husband to Meredith
brother to Calvin,
son to Jim and
Dana Hartshorn,
coauthor and
cofounder and
Shmoo and so much
more. We dedicate
this silly hack to
Len, who would have
found it absolutely
hilarious.
--Dan Kaminsky,
Travis Goodspeed

P.S. My apologies,
BitCoin people. He
also would have
LOL'd at BitCoin's
new dependency upon
ASCII BERNANKE
:'::::::::::::::::::
: .: ' ' ' ' : :':
::: _-__ ' :
: _," " ^x, :
' x7' '4,
  XX7 4XX
  XX XX
  Xl ,xxx, ,xxx,XX
( ' _,+o, | ,o+,"
  4 "-^' X "-^" 7
  l, ( )) ,X
: Xx, _ ,xXXXxx, _ ,XX
  4XXiX'----'XXXX'
  4XXi, _ _iXX7'
  , '4XXXXXXXXXX^ _ ,
  Xx, ""^^^XX7,xX
W,"4WWx,_ _ ,XxWWX7'
Xwi, "4WW7"4WW7',W
TXXWw, ^7 Xk 47 ,WH
:TXXXWw,_ "), ,wWT:
::TTXWWW 1X1 WWT:
----END TRIBUTE----

```

Figure 3. Extract from a very early chunk of Bitcoin's main blockchain

Figure 3 shows an ASCII extract from the Bitcoin blockchain, a tribute that was irremediably inscribed in the transaction history chain. A memorial to a leader of the “cypherpunk movement” is codified, literally, into Bitcoin’s “blockchain”, decorated with typical hacker irony. This is just a hint of what may appear as an “insider joke”, but is in fact the strong trace of a shared narrative.

The historical episode of passion in Bitcoin is connected to another project that is strictly related to the cypherpunk movement: its name, incredibly well known today, is Wikileaks.

Wikileaks has provided the supreme moment (καρῶς) for Bitcoin to become an urgency within the cypherpunk imagination and that of hackers at large: I’m talking about the financial blockade to Wikileaks.

Below is an excerpt of the account that Wikileaks staff makes of this episode on their website, to which is dedicated a whole page:

Since 7th December 2010 an arbitrary and unlawful financial blockade has been imposed by Bank of America, VISA, MasterCard, PayPal and Western Union. The attack has destroyed 95% of our revenue. [...] The blockade is outside of any accountable, public process. It is without democratic oversight or transparency. The US government itself found that there were no lawful grounds to add WikiLeaks to a US financial blockade. [...] The UN High Commissioner for Human Rights has openly criticized the financial blockade against WikiLeaks. [...] The blockade erects a wall between us and our supporters, preventing them from affiliating with and defending the cause of their choice. It violates the competition laws and trade practice legislation of numerous states. It arbitrarily singles out an organization that has

not committed any illegal act in any country and cuts it off from its financial lifeline in every country. [...]

In the US, our publishing is protected by the First Amendment, as has been repeatedly demonstrated by a wide variety of respected legal experts on the US Constitution. In January 2011 the U.S. Secretary of the Treasury, Timothy C. Geithner, announced that there were no grounds to blacklist WikiLeaks. There are no judgements, or even charges, against WikiLeaks or its staff anywhere in the world.

The blockade was an immediate reaction to the “cablegates” release, where an enormous amount of classified USA diplomatic documents had been published by Wikileaks. This episode did not please many powerful people in USA (arguably, Wikileaks has hit its military-industrial complex in many ways). Though the Wikileaks organization received much appreciation from all over the world, also in the form of monetary donations. While the media wave of cablegates was reverberating through the world’s screens, international transaction monopolies like Maestro and Visa blocked Wikileaks from receiving donations, without a legal mandate, nor a courtcase order. Wikileaks also had its registered Internet domains obscured, with the exception of the one registered in Switzerland.

Hackers believe the world can be changed and, while understanding the importance for code and shared protocols, they are determined to play on *neutral* grounds, which is also a condition for change to happen. Some readers may judge hackers as naïve for believing that there can actually be *network neutrality*, most system analysts, even in the financial sector, have recognised the presence of long-tail errors. Those familiar with the principles enunciated in Taleb’s Black-Swan will agree that it is impossible to establish neutrality within a tainted system, but, for the hacker community at large, the Wikileaks financial blockade was a radically new moment of fundamental betrayal. Thus it was a crucial momentum for the growth of Bitcoin: several hackers adopted it right in those days, feeling it was, rationally, liberally, the next thing to do. The growth of Bitcoin started then, as visible in *Figure 1* it was 5 months previous to the first Forbes article that popularized it.

8 Glory

Glory, in theology as much as in politics, is what takes the place of the inconceivable void that is the idleness of power; nevertheless, is this very inconceivable emptiness that nourishes and feeds the power (or, better said, what the apparatus of power transforms in nourishment) Giorgio Agamben

Every form of currency, since the very beginning of its earliest forms, has dealt with the grammar of power. It is the establishment of a sovereign and its glory that justifies the shared trust into a symbolic form of value circulation. The investment of power into currency, especially when its not backed by mineral values, is codified in mystery and glory.

Bitcoin is not exempted from such dynamics: it innovates the way the digital becomes tangible, a role with highly disruptive potential. Hence, even when choosing the iconography for its own currency, the Bitcoin community shows a political rupture.

The intriguing mystery of the identity of its disappearing author Satoshi Nakamoto, might seem a detail, but not for our analysis: it is of central importance to the Bitcoin myth and that of future crypto-currencies. Bitcoin has no single monetary authority, but a shared pact and the underlying rationality of a mathematical algorithm - the intangible dream of neutrality. Being deflationary, Bitcoins exist within a finite range of possibilities, a quantity of value that is increasingly difficult to mine. No one can create more Bitcoins than those established to be created in the first place, to the great horror of modern economists that regard fiat currency as a necessary tool to move within the troubled waters of contemporaneity, with good reason indeed. But there is no hierarchy in Bitcoin: meaning literally that there is no sacred origin (*ἰεραρχία*), no written fate, no single ruler, no second thought on its essence.

Bitcoin promises to be the neutral medium for an economy based on participation, not the edict of a king, a central bank, or their authorized intermediaries - nevertheless, it must be said, Bitcoin did create new riches, those who believed earlier than others in the promise of this algorithm. The rupture offered by this new perspective on money is not dealing with equality or welfare, it might not benefit society or help us get out of the crisis: it is a protest for network neutrality.

Such a medium, we must also admit, will likely incarnate the market freedom of the Austrian school of economics. The European Central Bank has produced an analysis of the Bitcoin scheme in October 2012 reciting:

The theoretical roots of Bitcoin can be found in the Austrian school of economics and its criticism of the current fiat money system and interventions undertaken by governments and other agencies, which, in their view, result in exacerbated business cycles and massive inflation.

This insight should be handled carefully: it might overstate on the ambitions of Bitcoin, which first and foremost is a successful implementation of a system for value transactions in the digital domain, whose success is due to the biopolitical dynamics we are exploring in this article. Nevertheless, the interpretation of its ethos in fieri is not far from reality. It is paradoxical how, in a time in which we face the failure of most Austrian economic theories, we are confronted with narratives that mystify and popularize them on the wave of technical innovation and functional transformation. But this is a reductionist way to describe Bitcoin and it strictly depends from the adoption of universal categories: I am convinced such a method of analysis can't lead the quest for comprehension we are engaging here. So let's take a step back from this dead end and look into Bitcoin's symbology.

If we look back in the history of icons used to mint money, we'll find a long stream of symbols of leadership: heads or bodies of humans or animals that address or signify the power of scientists, rulers, educators, judges or that of a nation-state. Many are the symbols of hierarchy that govern the minting and authentication of the currency, as well symbols of wealth and geographical maps. I'll refrain now from engaging an analysis of such symbols used in the past, but observe that Bitcoin has and will have a different symbology to glorify it.

The iconography of Bitcoin reflects the shared values of the community behind it. If there would be a person representative of it, this would be its mysterious creator Satoshi Nakamoto, but the fact that he doesn't really exist makes things much more interesting. One of the early symbols of Bitcoin was alpaca, for instance the mockup presented here comes from an old forum's thread and in its own way it is meant to celebrate the first artisans that ever sold their creations on the Bitcoin market.

As an experiment, in a previous article for the Bitcoin community I've suggested the use of the empty throne as a bridge symbol across classical, modern and post-human iconography. The image of an empty prepared throne (ἐτοιμασία τοῦ θρόνου) is an icon found in the Old Testament and in books comprising the Upanishad, a sacred icon whose value "...is never so powerful as when the throne is empty", commented once archaeologist Charles Picard. The empty throne was used on minted currency in the Augustan era and sculpted exemplars of it are found in Knossos and Rome.

But the response of the Bitcoin community to such an old symbol of power, despite the fact it could represent the absence of Satoshi Nakamoto, has been negative. Someone commented that "perhaps a broken empty throne would be even better, symbolizing the breaking of the old power", someone else suggested that "a physical Bitcoin should have a mirror in the middle. Bitcoin is all about the individual" and again another suggestion "Bitcoin is mercurial – it's quicksilver. It's the fool of the tarot and a touchstone. It turns base electrons into gold. It subverts and debases all norms and conventions. The fool is the perfect symbol for bitcoin". Many also acclaimed the use of the Guy Fawkes mask, already adopted by Anonymous, from the V for Vendetta comics and movie.

The glory behind Bitcoin is mostly shrouded in mystery, revolt against tyrannical injustice, the reclamation of individual rights, power distribution and the disintermediation and self-determination. But also, I strongly argue, by the transverse presence of a community feeling and the joyous consciousness that a powerful process is unfolding in history: those participating have the possibility to express themselves in their diversity, rather than the uniformed, sterile and omnipresent corporate language of economics.



Figure 3

After the phase in which the Multitude has built its body inside the language, the next opening cycle of conflicts will see the Multitude engaged in the construction of its body beyond language. Christian Marazzi



Figure 4: Protestors weaving a Bitcoin banner in Occupy Amsterdam, July 2012

9 Popularity

By now should be clear that such a process of subjectivation as the one we are describing is not the simple emergence of a new innovative technology, it is not just a $\lambda\acute{o}\gamma\omicron\varsigma$ on $\tau\acute{\epsilon}\chi\eta\eta$, it goes well beyond. The enormous popularization of Bitcoin is proof that the dimensions of this process of subjectivation are multiple and cannot be comprehended by adopting a single narrative, and even less so by using the categories of economic analysis.

The popularity of Bitcoin as of today is enormous and still growing: this is a result of the biopolitical progression described above and its inscription inside a particular context, it is not a quality of Bitcoin alone. Bitcoin is rooted in the protest movements that accompanied the financial crisis through 2009 until now, namely the Occupy movement. While there can be reason to conceal this fact for those who hail the unconditioned and instrumental success of Bitcoin, it is important to account this historically in order to understand what might happen in the future.

The cultural scene around Bitcoin is shaped around new values that, despite their many pitfalls, incarnate the rebellion against “The System”. In the last Bitcoin conference in Europe we have clearly seen that those people closest to it are definitely interested in the larger picture: they are conscious that a systemic critique is the underpinning of Bitcoin existence, to the point that the next conference title changed from being focused simply on Bitcoin to being called the “unSystem” conference with among the speakers Anonymous, Occupy London, Voina¹² and Birgitta Jónsdóttir¹³.

Being popular also means to be branched, forked, replicated, cloned, recombined and ultimately appropriated

¹²a Russian street-art group well known for their provocative and politically charged works of performance art.

¹³Member of the Constitutional Assembly of the Icelandic Parliament and former member of Wikileaks.

by the people: a popular icon will feed the mind of popular culture without consuming itself, but confusing its authenticity in the existence of new popular instances. This is already happening to Bitcoin with very interesting consequences. Considering that its popularity is mostly among the hacker (or, should we say, young cyborgs?) community, the branching of Bitcoin is giving birth to many valid technical implementations, that are both capable of functioning on large scale, and explore novel approaches to currency and networking.

Among the first forks of Bitcoin were ironic implementations of it: like Cosby coin featuring the popular TV star Bill Cosby with a computer, or Carrots - just carrots, or Weed which was a currency matched to the value of its developer's favourite Thai beer.

But there are also serious forks of Bitcoin, both alternative or complementary to it, and we can expect more in future: NameCoin (whose functionality is to register new network domains) or LiteCoin (which can be mined on the same machines mining Bitcoins, without interference) are just some valid examples.

A particularly interesting one is Freicoi¹⁴ which grafts on ideas by Silvio Gesell for a monetary system with zero interest on credit: the value of currency “decays”, meaning that as time goes by it loses value. Freicoi cannot work as the storage of value, a common practice among Bitcoin users, therefore it circulates faster. By implementing this feature, referred to as “demurrage”, this is one of the most promising forks of Bitcoin today, at least in theory.

With my own pet project in the Bitcoin galaxy, something called Freecoin¹⁵, I've started documenting the phenomenon of forking Bitcoin since its early days and advocated within the community for the “configurability of the genesis code” and in general to leverage the possibilities of customisation for the technology underlying Bitcoin. It is my belief that, while Bitcoin represents a unique political rupture with the old establishment governing money, it is not the ultimate solution to it.

The need for digital currencies based on triple-signed receipts cannot be simply satisfied by Bitcoin. Nevertheless, strengthened by the popularity and all consequences we have explored here, Bitcoin might stand on the longer term as a fixed reference for future implementations: it is realistic to predict that its value will only grow in future.

10 Conclusion

The time as come to explain the title of this article, namely, that Bitcoin is breaking the Taboo on Money. For many years we have taken money for granted, without even questioning its engineering, without analysing accountancy in systemic terms. We have used it and we have been used by it. To paraphrase Georg Simmel, we have made ourselves “indirect beings”, the intermediaries between money and the creation and satisfaction of our own desires.

Just like a taboo that is so close to us to make us turn the other way, we have avoided questioning what makes money exist. In the past 50 and more years people have quietly accepted the transformation of money into something more abstract, far from everyone's hands, in fact becoming just a number in the databases of banks, a gesture of interaction with computers that know more than we do about our possessions. While being the “root of all evil” for some, it has become close to a religion for others, but in both cases money has been too important to be questioned and its evolution too natural to be interfered with by the masses. It is a system that permeates most if not all societal interactions, at least in the Western world, so we assume it to be neutral and, in any cases, we will never question its existence.

Most political analyses study the dynamics related to the distribution of money, its relation to labour, accumulation, use value and exchange values. Universals have governed the entire discourse around monetary engineering

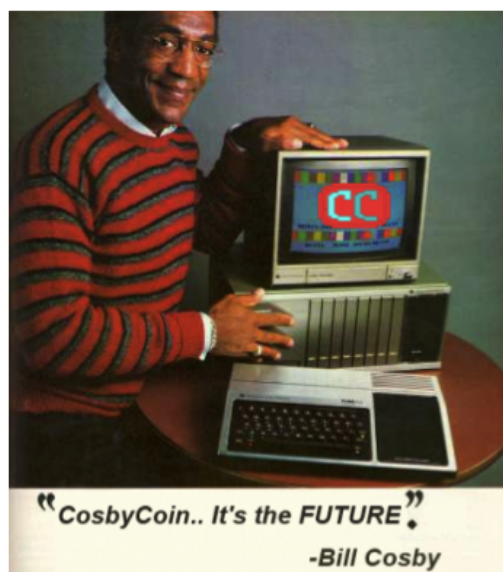


Figure 5: an ironical example of Bitcoin fork

¹⁴Freicoi: a peer-to-peer digital currency delivering freedom from usury" <http://freicoi.in>

¹⁵Freecoin is not a currency, but a suite to create P2P currencies" <http://freecoin.ch>

and mathematical models have been the method to explain its aspects. As a glaring exception to this, there are sociological analyses such as that made by Max Weber that evaluated the relationship between ethics and money across historical mutations of society. Yet, to this day, only few dared to look closer into currency systems and their biopolitical implications, without wearing the protective goggles of historically established universals: this has been a self-imposed taboo for many researchers and practitioners, to dissect this medium, just like a dead body that we are not allowed to study.

Now that money seems to be either dead or dying, it is the time to dare this dissection. It might be the case that, by trespassing this taboo, we will find out ways to change things on a larger scale, especially considering the long due line of innovation in the field of accountancy that has still to be applied.

Ultimately, there are proofs to the rupture I'm pointing out here, in the wake of many new currencies born after Bitcoin: with all irony and irreverence intended. The gates were left open by the mystery man: Satoshi the fool, Satoshi the saint, trespassed the line in front of everyone. There is no longer a taboo on money. Bitcoin is not really about the loss of power of a few governments, but about the possibility for many more people to experiment with the building of new constituencies.

11 Contributor details

Denis Roio, also known by his hacker nickname Jaromil, is an artist, activist and software developer at Dyne.org. His creations are recommended by the FSF and redistributed by several GNU/Linux and BSD operating systems worldwide, while he is also an active contributor to media theory discourses. Jaromil publishes conceptual art in digital form since the year 2000, has lead R&D activities in the Netherlands Media Art Institute for 6 years, was honored with the Vilém Flusser Award in 2009 and awarded a fellowship in the 40 under 40 program for young European leaders in 2012. He is currently writing his Ph.D. as candidate of the Planetary Collegium M-Node at NABA in Milano.



Figure 6: Portrait courtesy of Robert Lloyd

DYNDY

DIGITAL

CURRENCY

DESIGN

ADAM AVRIDSSON: GENERAL SENTIMENT

Electronic copy available at: <http://bit.ly/18pzTq3>

DRAFT VERSION

GENERAL SENTIMENT: HOW VALUE AND AFFECT CONVERGE IN THE INFORMATION ECONOMY.

“Wealth Management Group” uses the Values Tool to identify the values profile of client portfolio holdings in order to measure alignments with the value profile of clients. [...] What is of great benefit here is that relationship managers do not need to depend purely on their own judgement to identify their clients values, but are assisted by a powerful technology.

Sales Document from small internet startup addressing a large wealth management group.ⁱ

...hence exchange value must cease to be the measure of use value

Karl Marx, *Grundrisse*ⁱⁱ

The modern economy was organized around what David Stark has called a 'Parsonian Pact', by means of which 'value' and 'values' were kept separate (Stark, 2009:7). This applied in theory, where value concerns and questions about the origins, desirability or legitimacy of preferences and motivations were considered to be outside the object domain of economics, and, conversely, the question of how economic value was formed was considered beyond the reach of the disciplines, like sociology and anthropology, that studied 'values'. More importantly, it also applied in practice; the main criterion for the objectification and measurement of value that was applied throughout the modern corporate economy was a notion of productive time that was considered to be devoid of any affective dimension. While there were of course alternative 'voices' within the vast corpus of modern managerial thought - including, notably, the Hawthorne Studies and the tradition of Human Relations Management that arose out of them (Roethlisberger & Dickson, 1939, cf. Rose, 1975) - the basic principle of modern Cost Accounting, and of the whole Taylorist managerial system of which it was part, was the organization of productive relations so as to render them measurable in terms of standardized productivity rates that paid no attention to the messy mesh of emotions, opinions and social relations that made up the reality of concrete everyday work. This was not just a question of measurement systems abstracting from and not taking into account the actual affective dynamics of work life, but also of management philosophies actively trying to limit the space for, or even obliterate, unforeseen or undesirable forms of affect from the workplace. As Alan Liu argues, this creation of 'abstract labor time' (to use Marx's expression) as the principal criterion of value

measurement involved '*a complete system of emotional labor management that disallowed workers any "productive" emotion at all*' (Liu, 2004:94, cf. Gramsci, 1971).

Today it seems that this 'Parsonian Pact' is in the process of being overcome. Phenomena such as Ethical Consumerism, Corporate Social Responsibility, Fair Trade, and Socially Responsible Investment are all on the rise (Vogel, 2005, Stehr et al. 2006). And they all testify to a willingness to allow a broader range of affective concerns to influence the prices of assets and consumer goods, enabling value decisions about the legitimacy and desirability of the goals that guide economic pursuits to enter the picture. Beneath these trends lies a deeper structural tendency in which so called intangible assets, and in particular, brands have become ever more important as components of the market value of companies. (In 1950 intangibles accounted for roughly 20 per cent of the market value of the S & P 500, today the figure is 70 per cent. Brands account for, on average 30 per cent of market value, although this varies considerably between sectors and companies (Lev, 2001; Mandel et al, 2006; Nakamura, 2001; Gerzema, 2008)) Like many other intangible assets, such as 'knowledge capital', 'reputation' or 'corporate identity' - the terminology is diverse and ill defined in this field - brands represent the pricing of a wide range of affects, like the experience that consumers, and, increasingly, other actors such as employees, attribute to a brand, their perception of its 'fairness' or social utility, or the loyalty that they feel towards it.

The contemporary tendency towards the fusion of 'values' and value might to some extent be driven by pressure on corporate actors on the part of new consumer desires and the growing strength of a new, networked public sphere, where consumers and other actors can find new ways to express concerns that are related to diverse orders of worth, such as environmental sustainability and social justice (Garriga & Melé, 2004). However, this article will claim that the main reason behind this development is that the corporate economy itself has opened up to the inclusion of such diverse orders of worth by means of the calculative devices that it deploys to determine value. This opening

up has occurred through the rise of 'intangibles' as a new paradigm for calculating the value of assets and consumer goods. In turn, the rise of intangibles has been driven by two developments. First, a transformation of productive relations that has decreased the representativeness of 'the productivity of time' as a criterion for the measurement of value. Second, a development towards the objectification and measurability of affect, which has enabled affect to enter into the calculative devices by means of which economic values are set. Drawing on Gabriel Tarde, among others, I will suggest that this 'becoming objective' of affect has a long history that goes back to the origins of the modern, mass-mediated public sphere. But this trend has accelerated in recent years through the proliferation of social media together with a host of new technologies including, principally, data mining techniques such as network and sentiment analysis, that are able to represent individual affective investments as manifestations of an abstract general equivalent, what I call General Sentiment. I will suggest that these techniques, and the General Sentiment that they are able to represent, contains a new possibility for the stabilization of affective value, something that has so far been lacking in measurements of intangible value. The conclusion will draw out some tentative conclusions about the possible consequences of these developments for practical politics.

Before telling that story, however, it is necessary to give a brief description of the transformation of productive relations that have made values valuable and, consequently, such measurements desirable in the first place.

Linking Value and Affect- the Rise of Intangibles

What is value? Classical economic and social theory have attempted to answer to that question by pointing at a particular 'substance' that is held to create or determine value, whether this be 'socially necessary labor time' as for Marxists, or (marginal) individual utility as for the neoclassical school. Recent developments in economic sociology have instead pointed at the performativity of the calculating devices that are deployed either in order to measure value directly, or, to process the

necessary information that goes into the decisions that determine the relative values of assets and consumer goods (Callon, 1998, McKenzie, 2006). It is argued that once these become successful, they are able to posit their own object of measurement as a natural 'substance' of value. In this section I will follow this lead in arguing that one important cause behind the present fusion of affect and value has been the establishment of a range of devices that measure and represent value as an expression of what are known as 'intangibles' assets, and most importantly, brands. However, I will also argue that the success in establishing this 'intangibles paradigm' was linked to an actual transformation in the ways in which wealth is created. In other words, while actually operating notions of economic value may result from the performativity of calculative devices, it is difficult for those devices to establish themselves and achieve 'performative power' if they do not somehow reflect perceptions on the part of important actors or groups of actors as to the nature of the processes subject to measure and calculation.

Productivity

In the modern, or 'Fordist' economy, the prevailing measure of value was the productivity of time, and most importantly, labor time. Although this idea has a long history within economic theory, going back to 18th century economists such as Adam Smith, and before him Sir William Petty (see Linebaugh and Rediker, 2000), its institutionalization in managerial procedures and devices goes back to the managerial revolution at the turn of the last century (Chandler, 1977, Landes, 2003). This movement saw the rise of corporations and the standardization of modern disciplines like management, marketing and, importantly accounting. The modern, or Fordist corporation was based on the principle of vertical integration, or the internalization of as many aspects of the production process as possible within a sphere of control and command. Taylorism, along with technologies such as the assembly line, allowed the subdivision of internalized productive processes into discrete units that could be supplied with specific job descriptions. In parallel, Cost Accounting was based on the calculation of standardized productivity rates for each such discrete subunit, and the measure

DRAFT VERSION

of their value-added as quanta of productive time deployed. Deviations from such standardized productivity rates could be used to discipline or reward the workforce, because wages - as Fredrick Taylor himself had suggested - could be directly linked to the productivity of working time (Taylor, 1896). This meant that, at the level of the labor process, the tasks of measuring value and controlling the workforce were located in the same device: the productivity of labour as measured in relation to time. At the level of the firm, the notion of 'productivity' served both as an object for managerial intervention, and as an explanation and legitimation of profits as well as, for shareholders, asset returns. This does not necessarily mean that labour was effectively the only source of value, as orthodox Marxists would claim. But the way in which the production process was configured meant that the productivity of labour made sense as a transparent and commonly accepted way of representing processes of wealth creation, which could also confer legitimacy and rationality on the determination of wages and the allocation of capital.

The notion of productivity could work as a credible representation of the value-creating process for, principally, three reasons. First because variable costs, such as labour costs, were high in relation to 'overheads' such as machine capital or patents, about 90 per cent in the 1890s; in other words labour was effectively the most important productive resource (Boer and Jeter, 1993). Second, because the internalization of the productive process meant that firms created value chiefly by deploying their own proprietary resources which could figure in their balance sheets. Third, because this internalization of the production process meant that it could be subdivided into discrete units where diverse productivity rates could be calculated. These conditions are less applicable today.

If the rise of the Fordist corporation constituted a managerial response to the growing complexity and socio-spatial extension of productive processes, then the impact of information and communication technology - principally the link between Computer Aided Design (CAD) and

DRAFT VERSION

Computer Numerically Controlled (CNC) machinery - has, since the 1970s, enabled an even further extension of the levels of productive cooperation. Indeed, the present post-Fordist paradigm is marked by a socialization of productive processes outside of the factory, whether in the form of the 'Toyotist' model developed at Toyota in the late 1960s and early 1970s that combines flexible production, self organized teams and just-in-time flows with Taylorist subdivision of tasks and the organization of production around the large factory typical of the industrial model (Morris-Suzuki, 1984); the 'Italian' model of 'industrial districts' that deploys networks of small, specialized firms (Beccatini, 1989, Piore & Sabel, 1984); or the global value chain that combines a diverse typology of firms that are, often, organized, in clear hierarchies (as between first, second and third tier suppliers, Fumagalli, 2007, Bertin, 1985). While Taylorist managerial practices still prevail in many parts of the economy, and are on the rise in some sectors such as fast food and certain aspects of education (Smart, ed. 1999), the central tendency of the industrial model to concentrate as much production as possible in the factory has been inverted and replaced by a tendency to locate an ever larger share of production in productive networks that unfold outside the factory walls. Between 1985 and 2000, for example, the share of vehicle value deriving from outsourcing in the auto industry increased from 50 to 80 per cent in the case of Renault, and between 1997 and 2004 the share of (outsourced) imports to the US Auto Parts market grew from 40 per cent to 65 per cent. Today the supply chain of the auto maker Hyundai involves 400 first tier suppliers, and 2500 second tier suppliers (Velooso & Kumar, 2002).

Figure 1
market to book discrepancy
declining productivity of tangible assets
rising share of financial rents as components of corporate profits

The rise of intangibles

The consequences of these developments for value creation are summed up in the figure above. First, the socialization of material production means that the ability to engage in such forms of

DRAFT VERSION

wealth creation have been generalized. To quote management scholars Paul Adler and Charles Heckscher, '*the mysteries of effective commodity production have become common knowledge; they are now merely tickets for entry rather than the keys for winning the competition*' (Adler and Heckscher, 2006:28). Material production has become commonplace (or 'commoditized, to use an expression popular with business writers) and its share of value-added is in decline. The strategic focus on value creation is shifting towards so-called 'intangible' assets including, principally the capacity for innovation, flexibility and, most importantly, branding. But the production of such assets often occurs outside the control of single organizations, and sometimes, as in the case of brands, it builds on input from non-salaried actors including consumers and the public at large (Arvidsson, 2006). Furthermore, the creation of value in this way mostly employs resources, such as communicative and social skills, the value-creating potential of which are poorly related to the quanta of time in which they are employed. Instead, as Paolo Virno would argue, the creation of intangible value in the form of a corporate culture conducive to innovation or teamwork, or an attractive brand, involves 'virtuosity' in the appropriation of common knowledge, symbols, relations and competences, or General Intellect (Virno, 2004). This means that the value creation of intangible resources is less susceptible to measurement in terms of the productivity of time, and depends more on the ability to attract affective investments such as reputation, goodwill or employee motivation. While this does not mean that labour has 'disappeared' or 'no longer counts', it means that labour ever more creates value in ways that are poorly related to quanta of time. Indeed it can be argued that there is an extension of the range of social activities that now count as value-creating 'labour', like the 'labour' of consumers or that of internet users in general (cf. Fuchs, 2010, Zwick et al. 2009).

However, since the resources that are employed in the creation of intangible value, like General Intellect and communicative skills (or what Virno calls 'mass intellect') are often not proprietary, they barely figure on the balance sheets of companies. Together with a general financialization of

the economy, where larger shares of corporate profit derive from financial rents, this has caused a pressing issue of growing discrepancies between the market and book value of companies (Harvey, 2010). This, in turn, has created an opening for new kinds of calculative devices that are able to account for and make good these discrepancies, not least since the rational market hypothesis of neo-classical economics (and neoliberal ideology) is losing credibility among economists, social scientists and, crucially, actual practitioners (cf. Fox, 2009).

Brand valuation

The notion of 'intangible value' has emerged primarily as an answer to this problem of how to account for and make good widening discrepancies between market and book value. The origins of the concept can be traced to the transformation of accounting and control practices that accompanied the socialization of production in the 1980s. As outsourcing and the creation of global supply chains began to shift the strategically most important source of value away from productive time *per se*, to other 'assets' like capacity for innovation and flexibility, management responded by implementing measuring devices like Value Flow Analysis and Total Quality Management. These devices were aimed at measuring the productivity of the whole value chain (and not as earlier, a single unit of that chain), paying attention to novel factors like the ease of integration of the chain and the flexibility of its response to market conditions (Glover and Fitzgerald-Moore, 1999, De Angelis, 2007) In the 1980s, similar devices were developed for the control and management of knowledge work (chiefly through the pioneering work of Skandia AFS, cf. Edvinsson & Malone, 1997). Here new forms of bench-marking, such as 'balanced score cards' measured the efficiency of employees in wide variety of ways, including their cooperative and social skills: that is, their ability to learn from each other and extract operative skills from the General Intellect of the firm and its surroundings.

These devices were important for management and control purposes, but for value reporting

DRAFT VERSION

purposes, they tended to be subsumed under the concept of 'brand'. Again, the notion that brands could have economic value has a long prehistory. It goes back to the marketing revolution of the 1950s that began to shift managerial focus from production to sales and market demand as a source of value creation, and the parallel development of the concept of brand image as something distinct from products (Gardner and Levy, 1955). A more mobile consumer culture that created forms of demand that were more difficult to anticipate, along with the development of a global consumer culture and, with it, global brands (Levitt, 1983) put an extra premium on the additional ability to predict demand that came with brands. Along with these developments there was a growth in practices and devices, such as Customer Relations Management that extended the scope of management to the relations that a company could entertain with consumers, and eventually other stakeholders.

While these developments have paved way for the notion that the value of assets such as flexibility and knowledge was ultimately set by consumers, the necessity of measuring the value of such relations only became acute with the financial bubble of the 1980s. The wave of mergers and acquisition that then marked the 'creative destruction' of the remains of the Fordist industrial economy called for a legitimate way to account for discrepancies between market and book value. A number of brand valuation companies rose to the challenge pointing at brands, or the relations that a company had established with consumers as a credible source of the difference in value (Lury and Moor, 2010). For example, while today's leading brand valuation company Interbrand was founded in 1974, under the name of Novamark, it remained a brand and design consulting company for that decade. It only took up brand valuation in 1987. As its founder John Murphy told the trade magazine *Brand Management* in 2001, there was *'a huge buying and selling of branded-goods businesses where what was essentially being bought and sold was brands. But nobody knew how to value brands'* (Holdsworth, 2001). Interbrand went on to establish its leadership of the field by valuing the Pillsbury brand for the Grand Metropolitan PLC acquisition of Pillsbury Co.. From the

DRAFT VERSION

start, the Interbrand method contained three elements: first, an estimation of the strength of a brand based on its market and management; second, an estimation of the proportion of company earnings attributable to the brand; and third, a brand multiplier based on the 'quality' of the brand: a measure that built on market data as well as data on the affective relations that the brand had managed to install with consumers. ⁱⁱⁱ

Most contemporary brand valuation models maintain some version of this approach, although some simply calculate the difference between market and book value and attribute that to brand. However the tendency has been to measure consumer affect in more and more detailed ways and to give it a more central role in the calculation of 'brand multipliers' (that is, in estimates of the share of future earnings that can be reasonably attributed to consumer attitudes and relations to the brand as opposed to market factors like price, location or the strength of distribution channels- cf. Salinas & Ambler, 2009). For example, Young and Rubicam's *Brand Asset Valuator* centres on a calculation of consumer perceptions of brands ranked along four dimension: '*differentiation, relevance, esteem and knowledge*'. The Milward Brown *BrandZ* method creates its multiplier by estimating consumer relations to brand along a scale encompassing '*Bonding, Advantage, Performance, Presence and No Presence*'. ^{iv}

The point is that brand valuation established one of the first solid links between the public expression of affect, in the terms of the dimensions used to measure brand multipliers, and economic value, in terms of asset valuations on financial markets. In this way brand valuation constituted an emerging measure of the economic value of affect. I use the term 'emerging' because, to date, the field of brand valuation has not stabilized. In a survey from 2009 Salinas & Ambler (2009) identify 52 key operators globally, who use 17 different methods. Valuations of individual also tend to diverge greatly: the same survey shows how the valuation of Apple, Toyota and Samsung by the market leading valuation firms Interbrand, MBO and Vivaldi differ by as much as

300 per cent. What is more, there is a growing suspicion, even among practitioners, that existing valuation methods tend to overvalue brands. While reported brand values have been continuously increasing in the last decade, underlying data such as consumer confidence in brands are on the decline (cf. Gerzema, 2008). However a number of developments – driven by the very tendencies that made brand valuation possible in the first place - point towards a more stable measure of the economic value of affect.

General Sentiment

General Sentiment is a technology company that produces comprehensive research products to help marketing, sales and communications executives evaluate their brand performance in the media, and assess return on investment.^V

In the 1980s, when the concept of brand value first gained prominence within finance, accounting and management, it responded to the desire to solve two ‘mysteries’: the ‘mystery’ of value creation in an ‘*emerging different model, which responds now more and more to post-industrial organizational and management criteria* [that are increasingly] *service-based, immaterial, low workforce rate, network shaped* (Cordazzo, 2007:67); and the ‘mystery’ of growing discrepancies between market and book value. The solution to both mysteries was to attribute value to measurable public expressions of affect. However this solution was only possible because such expressions of affect had begun to become public and measurable in the first place.

What does it mean for affect to become public and measurable? It means that affect can be represented independently of the specific idea to which it is linked, that it can become visible as a distinct substance, so to speak. It is important to distinguish affect from idea. Gilles Deleuze does this masterly in his lectures on Spinoza:

‘the idea is a mode of thought that is defined by its representational character. This already gives us a first point of departure in distinguishing idea and affect (*affectus*) because we call affect any mode of thought that does not represent anything. So what does this mean? Take at random what anybody would call affect or feeling, a hope for example, a pain, a love, this

DRAFT VERSION

is not representational. There is an idea of the loved thing, to be sure, there is an idea of something hoped for, but hope as such or love as such represents nothing, strictly nothing. Every mode of thought insofar as it is non-representational will be termed affect.

(Deleuze, 1978)

Seen this way, the precondition for linking economic value to affect was that affect as such, regardless of the specific idea or representation to which it was linked, was becoming public and measurable, was acquiring a tangible substance. This process towards a substantiation of affect has involved both the remediation of affect through the restructuring of the public sphere, and the development of new measurement devices that are able to create a new general equivalent, against which specific manifestations of affect can be evaluated, regardless of the concrete ideas or representations to which they are tied: as General Sentiment.

The remediation of affect

The notion that the modern, mediated public sphere is capable of transforming individual ideas into a General Will (to use Rousseau's expression) that results from rational forms of public deliberation is well established in modern social theory (cf. Habermas, 1989). There is however a less established, but important parallel tradition that points at the capacity of modern forms of publicity to public to bring forth other forms of affect.

Starting with 19th century 'crowd psychologists' like Gustave le Bon, Hippolyte Taine and Schipio Sighele, this line of thought has its perhaps most sophisticated 'classical' expression in Gabriel Tarde. For Tarde, the becoming public of affect is strictly connected to the rise of modern consumer culture, and the new link between affect and economic value that it promoted. In his *Psychologie économique* (1902) Tarde pointed out how, with the formation of modern mass publics, the value of commodities is increasingly built on their ability to build and sustain forms of 'mental communion' (*communion mentale*) among members of the public. In the absence of traditional value systems, such mental communion is what sustains conventional notions of the 'truth, beauty and utility' of

DRAFT VERSION

goods, on which, in turn, their value is ever more based. It is important to stress that for Tarde, the formation of such a mental communion precedes the formation of opinion; it is the mental communion that forms around an object, the fact that people affect each other in relation to it, that sustains opinions about its utility or beauty. Indeed for Tarde the very basic elements of the social are such mental communions, in which one mind affects the other in a multiplicity of ways. That is why he kept arguing for a social psychology, against Durkheim's sociology.^{vi} In Tarde's view, the production of value in consumer culture thus directly involves and includes the new and rapid forms of circulation and combinations of affect that are enabled and brought out into the open by a modern media environment, and, importantly by the new role of consumer goods as catalysts of such forms of public affect. Friedrich Kittler makes a similar point in *Discourse Networks*: rather than being experienced as something entirely interior, as in the 19th century romantic tradition, the formation of affect and sentiment is now partially externalized, guided by the flow of public opinion and the catalytic role of celebrities and *divae* as (momentary) containers of affective investment. While the subject of the 1800s experienced his ideas and affects as his own, the subject of the 1900s experienced her ideas and affects as something that she adapts from the outside world, (Kittler, 1990).

To Tarde, it is the immaterial aspects of goods, their 'truth, beauty, and utility' that sustains communions of public affect. Since Tarde, cultural studies and the sociology of consumption has provided a large corpus of research that shows how the immaterial aspects of consumer goods are able to sustain sub-cultures, brand communities and other kinds or mental communions that are kept together by strong affective investments (Arvidsson, 2006, Maffesoli, 1991). So it would seem reasonable to suggest that the remediation of social relations that has accompanied the rise of consumer culture has effectively managed to transform the nature of affect, from something private or at least located in small interaction systems, to something that acquires an objective existence as a value creating 'substance' in the public domain. Social media have taken this process one step

DRAFT VERSION

further.

Possibly we are in the middle of a remediation of the public sphere that is as radical as that which followed the impact of print, as social media are rapidly becoming the default application of the internet and the 'normal' way to communicate (in the sense of transferring ideas as well as in the sense of fostering affective 'communion' with others). For example, during the first 8 months of 2009 Facebook grew by 100 per cent, from 100 million to 200 million users; at the time of writing it has surpassed 500 million; twitter grew by 1440 per cent in 2008 and is presently targeting one billion users. Already today more people use social media than email.^{vii}

What happens when social and affective relations are remediated by social media? Social media have two central properties that are relevant to this argument. First, if, as McLuhan claimed, print fostered the cold and distant subjectivity of bourgeois culture, then social media tends to connect people to each other. As many media scholars have underlined, the result is a more interdependent, or even 'networked' subjectivity, where proximity to and close affective experiences of others become important building blocks for identity, and where other people's evaluation of one's identity (or 'brand') becomes central not only to one's sense of self-worth, but also, and increasingly, to one's objective value as a professional, networker or 'micro-celebrity' (Marwick and Boyd, 2010, Hearn, 2008). Second, social media add to the process of the becoming public of affect by introducing an aspect of objectivity. Affective relations now become tangible in a wide variety of manifestations: the links that tie a blog to its network, friends on a social media page, re-tweets, or even explicit ratings of the truth, beauty or utility of a person, object or service. In this sense, social media are 'phatic media' in the double sense of both fostering the formation of public affective relations through 'non-dialogic and non-informational' practices of 'keeping in touch' (Miller, 2008:388, 395), and of enabling such manifestations of public affect to act as an objective criterion of the value of individuals and other actors. However, this becoming-objective of public affect and

its becoming-effective as a criterion of value is also dependent on the development of new methods of measurement.

Affective proximity

Tarde's insight about the role of public affect in value creation led him to argue that economics should be rationalized through the development of instruments that are able to measure such valuable investments of public affect with greater degrees of precision (Latour, 2004).

However, during most of the 20th century neither economics nor the social sciences generally have paid much attention to Tarde's call. Economics remained with a one-dimensional definition of value, and even if the social sciences have developed a rich tradition of communication research, this has, with few exceptions, been mainly directed at studying the diffusion of ideas and opinions, and not the formation of affect *per se*. One notable exception has been the tradition of advertising psychology, which, starting with the pioneering work of Walter Dill Scott, devoted a lot of energy to developing methods for measuring things the suggestive power of advertisements, above and beyond their powers of rational persuasion (Arvidsson, 2003, Beale, 1992, Chessel, 1995). This research was linked to a notion of 'suggestion' where advertising was thought to work mainly through its powers of affective attraction.

However, within advertising thought this paradigm was already marginalized by the 'hard sell approach' by the 1930s. This approach, which emphasized rational persuasion, remained dominant, in advertising theory if not always in practice, until the 1960s (Curti, 1967). It was linked to the emergence of radio as the most important advertising channel in the 1930 and was linked to socio-demographic techniques that built on the segmentation of audiences into predetermined classes (the so-called ABCD-approach) as the main mechanism of determining the value of audience segments (Arvidsson, 2003a, Lockley, 1950, Converse, 1987). The ABCD approach institutionalized the

notion that the value of advertising space depended on the 'productivity' of its destined audience segment in transforming advertising stimuli into effective demand. In this way the value of advertising space could be calculated in terms of the attention time of a particular segment, mirroring the notion of productive time deployed in Fordist cost accounting.^{viii}

The notion of affect as a criterion of value would only affirm itself in the 1960s, with the establishment of methodologies for so-called psychographic, or life-style segmentation. This technique built on the use of large scale surveys that mapped consumers according to a wide range of different values that, like the AOI (Attitudes, Opinions, Interests, Wells & Tigert, 1971) and later VALS (Values, Attitudes, Lifestyles, Mitchell, 1984) went far beyond what was directly related to purchases or attitudes to consumer goods. This data were subsequently submitted to inductive multivariate analyses (or 'cluster analysis') and the resulting correlations were represented as 'lifestyles'.

The reasons behind the success of psychographics were many. The 1960s had seen a transformation of the media environment, driven by the establishment of television, that demanded new kinds of audience segmentation; the computers necessary to perform the complicated forms data processing now became affordable for mid-sized companies like advertising agencies and market research companies; the previous decade has seen a rising popularity of qualitative audience research that supplied new and interesting kinds of information. Most importantly however, there was a perception of a general transformation of consumer culture, and a sense that the affective structure of consumers, their desires, were being de-linked from class structures (Frank, 1997, Wells, 1974). This methodology involved a number of important innovations. First, it pioneered the kinds of inductive statistics that have become a basis for the data-mining techniques still in use today (see below). Second, lifestyle segmentation created a picture of the market in which consumer demand was seen to be determined by a number of affective concerns that appeared as independent in

DRAFT VERSION

relation to the position of consumers *vis-a-vis* their position in the industrial economy. Third, and importantly, psychographics introduced, if only in an embryonic form, a new definition of economic value. As lifestyle analysis was used to determine the value of advertising space in terms of how well the value structure of a particular medium coincided with the 'lifestyle' of a targeted consumer group, it introduced, for the first time, a notion of 'value distance' or affective proximity as a measure of economic value.

In the 1970s psychographic segmentation was based on large scale surveys. Beginning in the 1980s the proliferation of credit cards and bar codes created vast data banks that were generated 'naturally', so to speak, at the point of purchase in stores and supermarkets. This information was subjected to data mining techniques that were essentially refined versions of the kinds of multivariate cluster analysis deployed in psychographics, to generate the kinds of information that went in to Customer Relationship Management programs, and eventually brand valuation instruments (Arvidsson, 2003a). More recently, the arrival of the internet, and in particular of social media, has greatly expanded the range of naturally occurring data that can be submitted to such data-mining techniques, and, social media in particular, has provided a wide range of data on public affect that lend itself to such statistical profiling.

The methods that have been most popular in processing social media data have been network analysis and sentiment analysis. Network analysis has been deployed within the social sciences since the 1960s, but the arrival of networked communication media has given a boost to this methodology as a wide range of meaningful large relational data-sets are now available (Barabasi, 2003, Watts, 2004). In the field of value measurement, network analysis have been used for some time by managerial scholars in computing inter and intra firm 'social capital', and more practically, by companies, including IBM, as a knowledge management tool: calculations of the centrality of employees to communication flows was been taken as a valid measure of their economic

DRAFT VERSION

productivity (Baker, 2009). In calculating the value of public affect the main application of network analysis has been that of identifying 'influencers', people who have a central position in relational networks and communication flows, and who are therefore 'worth more' as communication channels. Yahoo has been using this approach for a long time in order to identify 'influencers' to be used in marketing campaigns, and Facebook is developing a similar approach to enable advertising to be placed on the basis of preferences expressed in personal networks. In the growing business of applying data mining to the measurement of brand strength and Return on Investment (ROI) in viral marketing campaigns, network analysis is used in identifying the degree to which a certain campaign has managed to influence actors that are central to communication networks as one dimension of ROI. A second dimension is provided by Sentiment Analysis.

Sentiment analysis is based on the automatic recognition of the affective valence of words or patterns of words used in text. The challenge consists in overcoming the ambiguity and polyvalence of natural language. This issue can be addressed by machine learning approaches where an algorithm is trained on independent data-sets (cf. Dave et al. 2003, Pang & Less, 2008, Pang et al, 2002). However, such approaches have only become feasible with social media, for two reasons. First because only these platforms supply the vast amounts of data needed to even out errors and reach reliability rates compatible with those generated by human observers . Second, because only social media provide large enough sets of training data, such as movie or product reviews, where text is linked to quantitative estimates of value (in the form of number of 'stars' or other kinds of ratings). In practice sentiment analysis is used to generate quantifications of the intensity of affective investments in an object. Brand valuation service such as Radian or Sysomos, for example use sentiment analysis to determine whether a branding campaign has generated a shift in the positive or negative intensity of affect invested in the brand on the part of the public, or, to use the current term, in sentiment.^{ix} Similarly, sentiment analysis is growing in importance as a component of information systems for financial operators and other kinds of asset valuers. The company

DRAFT VERSION

Streambase, for example, generates trading recommendations on the basis of a sentiment analysis of online news. *Covalence* mines a wide range of sources on Corporate Social Responsibility and subjects them to a sentiment analysis, the output of which is presented as an indicator of the 'ethical status' of an asset.^x Many more of these applications are emerging, in particular around twitter because it has (so far) permitted public access to its data and is rapidly becoming a fairly representative platform of internet traffic in general (see the link-list in the Appendix for more examples of this).

Figure II
Screenshot Covalence

The use of network analysis, sentiment analysis or some combination of the two is presently emerging as a new paradigm for measuring assets, communication campaigns or individuals in terms of what is increasingly talked about as their 'reputation' (Marwick, et al. 2010. In most models, reputation is defined as some combination of three measurements: the number of times that an object is mentioned; the network centrality (or influence) of the actors mentioning it; and the affective intensity (sentiment) with which they mention it. All of these measurements measure affect independently of ideas: the ideational content of specific affective investments is abstracted from. Instead the value of affect is defined in terms of proximity. Network analysis defines influence (or network centrality) according to a number of measures that describe their distance to other nodes in the network, or to use the increasingly influential term coined by Facebook founder Mark Zuckerberg, 'social graph'- a sociogram that depicts all relations between individuals on the site- regardless of what that particular network (or social graph) is *about*. (Facebook is of course not about anything, it is a place for the formation of affective, 'phatic', relations.) Sentiment analysis defines sentiment according to two dimensions, 'valence' or the sum of the affective valence of the words occurring in a message and 'arousal' or the sum of the absolute values of the valences. Here too the affective valence of words is defined according to a variety of lists that report their affective

charge in natural language use, independently of the ideas that they might convey, individually or in combination (see for example Bradley and Lang, 1999).

General Equivalent

My argument is that the convergence of social media platforms and data-mining techniques and methods like network and sentiment analysis are creating a common approach towards the measurement of public affect, or General Sentiment. This common approach is emergent: it has already established itself in some sectors, like brand valuation and the estimation of ROI on viral marketing campaigns; it is growing as a basis for social media business models; and it is making inroads in areas such as financial asset valuation and estimations of the value of corporate social responsibility and ethics. What is more, this approach has a history that goes back to the 1970s and the impact of psychographic segmenting. In other words it has been emergent for a long time, and this emergence is undergoing a natural acceleration with social media.

This emergent common approach is built on a distinct way of objectifying affect. First, it is based on inductive statistics like cluster analysis and other forms of pattern recognition that are able to find regularities in large data sets without departing from any *a priori* presuppositions about the nature of those regularities. This means that General Sentiment is represented as an emergent variable that does not appear to be caused by any other factors. Like gold for the classical economists it can be a kind of *deus ex machina*: the commodity (or in this case, the artifact) by means of which the value of all other commodities (assets or communication channels) is established.^{xi} Second, General sentiment is quantified in terms of value distance, or, which is the same thing, affective proximity. This was an element already in psychographic clustering where clusters were defined according to vector distances in a multivariate space, and it is a basic presupposition in both network and sentiment analysis. The criterion of 'distance' is able to generate a measure of General Sentiment

DRAFT VERSION

that is independent of the particular ideas and representations that might ground individual value judgement. Regardless of whether I am a Christian or a Muslim, the tweets that I produce can still be judged in terms of a universal, if temporary, scale of positivity and negativity. The same thing goes for my position in a network, or for my expression of preferences in rating systems. However, like the General Equivalent of money, and unlike the universals of modern morality, the standard of judgement does not refer to any fixed values, but only refers back to the status of the system as a whole. It is not a matter of moral universality. Positive or negative sentiment is judged according to a wordlist that is itself derived empirically from natural language use. And different such word lists are constructed as algorithms are trained on different data sets, such as movie reviews, financial data, or ratings of different kinds of consumer products (see for example O'Hare et al, 2009), and network centrality is calculated in relation to the network itself. So it seems that we are acquiring a new General Equivalent - a General Sentiment - that is measured according to three dimensions, the strength of the affective charge of a message (sentiment), its influence (network centrality) and the numerical size of its occurrence. Incidentally these dimensions coincide precisely with the factors that Gabriel Tarde thought would determine the strength of the mental communions that he argued underpinned perceptions of immaterial value: '*le plus ou moins grand nombre: le plus ou moins poids social (ce qui veut dire ici considération, compétence reconnue) des personnes qui s'accordent à l'admettre, et le plus ou moins d'intensité de leur croyance en elle*' (Tarde, 1902:62).

The emergence of this general equivalent is the combined outcome of new measurement systems and an ongoing remediation of affective relations. Just as, according to Marx, the re-mediation of productive cooperation, through assembly lines, factory systems and ultimately a world market effectively made individual skills and competences measurable in terms of abstract labour time, so the remediation of affect, through the industrialization of culture and the emergence of a mass public and more lately social media, confers a general nature on what were previously particular and private manifestations of affect and renders them objectively comparable, measurable and

visible as a manifestation of General Sentiment. To Marx, the value-form that eventually emerged out of this process, the productivity of labour time, was a direct reflection of the objective reality of an underlying value-creating process. Can we claim that the value form of General Sentiment - affective proximity - is a direct reflection of the objective value creating process that unfolds in the social media based public sphere? Maybe we can put it in a weaker way: the predominance of finance as the main mechanism of valorization and the strong link that is emerging between financial value and objectified forms of reputation, like brand; the importance of brands as intangible assets for companies and, increasingly, for individuals; the crucial role that connections and social capital plays in a networked economy; and the growing importance of social media are all factors that are likely to make a measure of value in terms of General Sentiment, as defined above, reflect perceptions on the part of important actors or groups of actors as to the nature of the processes subject to measure and calculation.

Conclusion: Politics After Parsons?

It would seem that the devices that are presently emerging as measurements of value in terms of General Sentiment are effectively paying heed to Tarde's call for a more multidimensional economic analysis. Ultimately this might lead to a recognition that value(s) decisions are ever more based on multiple and diverse processes of public deliberation, rather than on universally valid rules; that they are essentially political, or perhaps better, ethical. In such a situation a political agenda could reasonably aim for the opening up and democratization of such deliberative processes, allowing them to reflect a multitude of different perspectives and value horizons. Conceivably this can be achieved through the construction of a multitude of different devices that allow for such extended forms of deliberation, by means of a *Dingpolitik*, to use Bruno Latour's (2005) term. For this to happen it is crucial that access to the underlying data remains open and free, so that actors that do not have the economic means to pay for such data, such as activist groups, consumer cooperatives or other non-profit organizations, will still be able to construct and operate devices. To date this has

DRAFT VERSION

been the case in relation to Twitter (but not Facebook), but rumour has it that Twitter is now planning to charge for data access. In the light of this, an important political agenda, in for example, traditional parliamentary politics, must be to work for the regulation of social media 'utilities' (Boyd, 2010) in such a way that data access remains as open as possible. Final strong sentence?

-
- i 'Wealth Management Group' is a pseudonym. I have obtained permission to quote the document on condition that the identity of the actual companies involved is not revealed.
 - ii Trans. Martin Nicolaus, Marx, 1973(1939):705.
 - iii See also Interbrand Corporation, Company History, available at <http://www.fundinguniverse.com/company-histories/Interbrand-Corporation-Company-History.html> accessed 7/12-2010.
 - iv On BrandZ, see 'Cristiana Pearson explains the methodology behind the 2010 BrandZ Top 100', available at <http://www.millwardbrown.com/Sites/mbOptimor/Ideas/BrandZTop100/VideoPlayer.aspx?Param=1124997e-0e18-4bc9-bc5a-29b2f964bb66> , accessed 7/12- 2010, on the Brand Asset Valuator, see <http://www.brandassetconsulting.com/> .
 - v <https://www.generalsentiment.com/what-we-do.html> , accessed 26/11-2010.
 - vi 'La société est un tissu d'actions inter-spirituelles, d'états mentaux agissant les uns sur les autres. [...] Chaque action inter-spirituelle consiste dans le rapprochement entre deux êtres animés, dont l'une impressionne l'autre [...] La société donc, en son essence intime, doit être définie une communion mentale.' (Tarde, 1902:1-2)
 - vii MacMillan, D. 'Twitter targets one billion users, challenging Facebook for ads', *Bloomberg BusinessWeek*, 12/10-2010, available at http://www.businessweek.com/technology/content/oct2010/tc20101012_048119.htm accessed 7/12-2010, Rayport, J. 'How social networks are changing everything' *Businessweek*, May 7, 2009, available at http://www.businessweek.com/magazine/content/09_20/b4131067611088.htm , accessed June 12, 2009,
 - viii In the 1970s, Dallas Smythe would build on this model in developing his theory of the 'audience commodity' (Smythe, 2002 [1978]).
 - ix <http://www.radian6.com/> , <http://www.sysomos.com/>
 - x <http://www.streambase.com/> <http://www.covalence.ch/>
 - xi Of course, Marx saw gold as a fetish for labour. He argued that the value of gold in itself dependent on the socially average labour time needed in its production.
-

CONCLUSIVE FEED-FORWARD

The words above offer a limited account of the issues at stake, and we are aware that our contribution is not enough, a drop in the Ocean. However, and much desirably, as it has been recently granted the necessary resources within the D-CENT project (EU-FP7), in the next few years, DYN DY will deepen the R&D efforts toward the implementation of a social digital currency, Freecoin (freecoin.ch). This experiment will give more data for proceeding toward making this a better place. Freecoin is a fork of Bitcoin, thought of as suite for P2P currencies, rather than exclusively a crypto-currency. It is the attempt to help answering to questions such as: is it possible to design currency-creation mechanisms that tap into a correlative and collective democratic decision-making process? What are the consequence of a customizable genesis block for the users within a participatory payment system? Can we have proof-of-work mechanisms of currency mining for mutual credit systems sharing a same standard of value? On a managerial level, to what extent is it possible and desirable to design social digital currencies for and by the users? On a socio-economic front, can a P2P crypto-currency system help users gather bottom-up by creating a social economy operating in parallel with the conventional one? On the political side, what are the roles of regulators, public authorities and the private sector, respectively? Finally, how possible, reliable and viable is an intentional process of mass cultural adaptation to a new experience of money, alternative to the current one?

References:

- Accademia Nazionale dei Lincei, "L'economia palaziale e la nascita della moneta: dalla Mesopotamia all'Egitto" (Atti della Conferenza internazionale, Roma 12-13 febbraio 2003). Roma. 2005. Approximative translation: "Palatine economy and the birth of money: from Mesopotamia to Egypt (publication of the international conference, Rome 12-13 February 2003).
- Adler, P. & Heckscher, C. 2006, 'Towards collaborative community', eds. Heckscher, C. & Adler, P. *The Firm as Collaborative Community*, Oxford; Oxford University Press.
- Aldridge, Irene, *High Frequency Trading - a practical guide to algorithmic strategies and trading systems*. Hoboken: John Wiley & Sons, Inc. 2010.
- Agamben, G., "Il Regno e La Gloria", Neri Pozza. 2007.
- Ascott, R., "Telematic Embrace", University California Press, 2003.
- Austin, John L., *How to Do Things With Words*, Oxford University Press: Oxford, England, 1962.
- Arvidsson, A. 2003, *Marketing Modernity. Italian Advertising from Fascism to the Postmodern*, London; Routledge.
- Arvidsson, A. 2003a, 'The prehistory of the panoptic sort. Mobility in market research', *Surveillance & Society*, 1 (4) available at <http://www.surveillance-and-society.org> accessed, 14/12-2010-.
- Arvidsson, A. 2006, *Brands. Meaning and Value in Media Culture*, London; Routledge.
- Bagehot, Walter, 'The General Aspect of the Banking Question', no. 1, a letter to the editor of *The Economist*, February 7, 1857, in *The Collected Works of Walter Bagehot*, ed. Norman St. John Stevas. London: The Economist, 1978, vol. 9, p. 319.
- Baker, S. 2009, 'Putting a price on social connections', *Bloomberg Businessweek*, April 8, 2009, available at http://www.businessweek.com/technology/content/apr2009/tc2009047_031301.htm?link_position=link1 , accessed 16/12-2010.
- Bank for International Settlements (BIS), *Implications for Central Banks of the Development of Electronic Money*, *Bank for International Settlements, Basel, 1996*.
- Barabasi, L., *Linked. How Everything is Connected to Everything Else and What it Means*, London; Plume Press. 2003.
- Basel Committee, *Risk Management for Electronic Banking and Electronic Money Activities*, Basel Committee Publications No. 35, Basel, Bank for International Settlements, March 1998.
- Beale, M., *Advertising and the Politics of Public Persuasion in France, 1900-33*, Ph.D. dissertation, Department of History, University of California at Berkeley. 1991.

- Beccattini, G., *Distretti industriali e sviluppo locale*, Torino; Rosenberg & Seller. Bertin, G. 1985, *Multinationales et propriété industrielle: le contrôle de la technologie mondiale*, Paris; Presses Universitaires du France. 1989.
- Boyd, d., 'Facebook is a utility. Utilities get regulated', Zephoria.org, 15/5-2010, available at, <http://www.zephoria.org/thoughts/archives/2010/05/15/facebook-is-a-utility-utilities-get-regulated.html>, accessed 15/12-2010.
- Boer, G. & Jeter, D., 'What's new about modern manufacturing? empirical evidence of manufacturing changes', *Journal of Management Accounting Research*, 5, Fall 1993, pp. 61-83
- Bradley, M & Lang, P.J., *Affective Norms for English Words (ANEW): Stimuli, instruction manual, and affective ratings*. Technical Report, Center for Research in Psychophysiology, University of Florida, Gainesville, Florida. 1999.
- Bulgarelli, Odoardo, *Il Denaro dalle Origini delle Origini* (approximated translation: Money from the Origins of its Origins), Rome: Spirali. 2001.
- Callon, M., „Introduction: the Embeddedness of Economic Markets in Economics“, ed. Callon, M., *The Laws of the Markets*. Oxford: Blackwell. 1998.
- Cecchetti, Stephen G., Madhusudan S. Mohanty and Fabrizio Zampolli, ‘The Future of Public Debt: Prospects and Implications’, BIS Working Paper #300, Basel: Bank for International Settlements, March 2010.
- Chandler, A., *The Visible Hand. The Managerial Revolution in American Business*, Harvard; Belknap. 1977.
- Chessel, M., *L'Émergence de la publicité. Publicitaires, annonceurs et affichistes dans la France de l'entre-deux-guerres*, Ph.D. dissertation, Department of History and Civilisation, European University Institute, Fiesole, Italy. 1995.
- Converse, J.M., *Survey Research in the United States, its Roots and Emergence, 1890-1960*, Berkeley; University of California Press. 1987.
- Cordazzo, M., 'IC statement vs. environmental and social reports: An empirical analysis of their convergences in the Italian context', eds. Zambon, S. & Marzo, G. *Visualizing Intangibles: Measuring and Reporting in the Knowledge Economy*, Aldershot; Ashgate.
- Curti, M. 1967, 'The changing concept of human nature in the literature of American advertising', *Business History Review* XLI (4), pp. 335-357. 2007.
- Dave, K., Lawrence, S. & Pennock, M. 2003, 'Mining the peanut gallery: opinion extraction and semantic classification of product reviews', WWW'03: Proceedings of the 12th International Conference on the World Wide Web, New York: ACM, pp. 519-528.
- De Angelis, M., *The Beginning of History. Value Struggles and Global Capital*, London: Pluto Press. 2007.

- De Goede, Mareike, *Virtue, Fortune, And Faith: a genealogy of finance*, University of Minnesota Press, 2005.
- Deleuze, G., 'Lecture on Spinoza's concept of affect', Course Vincennes, 24/1/1978 (transcript) eds. Deleuze E. & Deleuze, J. available at <http://www.webdeleuze.com/php/sommaire.html> , accessed 10/12-2010. 1978.
- Dodd, Nigel, *The Sociology of Money - economics, reason and contemporary society*, Polity Press, 1995.
- Douthwaite, Richard, *The Ecology of Money*, Schumacher Briefings (No 4). 1999.
- Edvinsson, L. & Malone, M, *Intellectual Capital: Realizing Your Company's True Value By Finding Its Hidden Brainpower*, New York; Harper Business. 1997
- European Central Bank, 'Virtual Currency Schemes', Report Oct. 2012 - <http://bit.ly/RBbPWM>.
- Fabbrichesi Leo, Rossella, *Introduzione a Peirce* (approximated English translation: An introduction to Peirce), Milano: Laterza. 1993.
- Federal Reserve of Chicago, *Modern Money Mechanics*, free booklet published by the FED. 1961.
- Federal Reserve Bank - Beige Book, 2009.
- Flusser, V., "Writings", Minnesota University Press, 2002.
- Foque, J.P. and J. Langsam (eds.), Andrew, Lo, 'Fear, Greed, and Financial Crises: A Cognitive Neurosciences Perspective', in *Handbook on Systemic Risk*, Cambridge University Press, 2013.
- Foucault, Michel, "Cours au Collège de France 1978-1979", Feltrinelli, 1979.
- Foucault, Michel. *The Order of Things*. Psychology Press, 2002.
- Fox, J., *The Myth of the Rational Market. A History of Risk, Reward and Delusion on Wall Street*, New York; Harper Collins. 2009
- Frank, T., *The Conquest of Cool*, Chicago; University of Chicago Press. Fuchs, C. 2010, 'Labor in informational capitalism and on the internet', *The Information Society*, 26:3, pp. 179-196. 1997
- Fumagalli, A., *Bioeconomia e capitalismo cognitivo. Verso un nuovo paradigma di accumulazione*, Rome; Carocci. 2007.
- Galbraith, John K., *Money: whence it came where it went*. 2nd. ed., London: Penguin Books. 1995.
- Gardner, B. & Levy, S., 'The product and the brand' *Harvard Business Review*, March-April, 1955.

- pp. 33-39. Garriga, E. & Melé, D., 'Corporate social responsibility theories: Mapping the territory', *Journal of Business Ethics*, 53, pp. 51-71. 2004
- Gerzema, J., *The Brand Bubble. The Looming Crisis in Brand Value and How to Avoid It*, New York; Jessey-Bass. 2008.
- Gesell, Silvio, *The Natural Economic Order*, San Antonio, TX: The Free Economy Publishing Co., 1934 (Translated from the sixth German edition). Originally published in 1913.
- Glover, L. & Fitzgerald-Moore, D., Total Quality Management. Shop Floor Perspectives', eds. Mabey, C., Skinner, D. & Clark, T. *Experiencing Human Resource Management*, London; Sage, pp. 54-72. 1999
- Graeber, David, *Debt: The First 5,000 Years*, Melville House, 2011.
- Gramsci, A. 1971, 'Americanism and Fordism', eds. Hoare Q. & Nowell-Smith, G. *Selections from the Prison Notebooks*, New York; International Publishers.
- Greco, Thomas, *The End of Money and the future of civilization*, Floris Books, 2009.
- Greco, Thomas H., *New Money for Healthy Communities*, Electronic ed. 1994.
- Grierson, Philip, *The Origins of Money*, London: Athlone Press. 1977.
- Grigg, I., "Triple Entry Accounting", Systemics Inc. 2005.
- Groppa, O., 'Complementary Currencies, Mobile Money and Its Impact on the Economy', unpublished.
- Habermas, J., *The Structural Transformation of the Public Sphere. An Inquiry into a Category of Bourgeois Society*, Cambridge (Mass); MIT Press. 1989
- Hardt, Michael, and Antonio Negri. *Commonwealth*. Harvard University Press, 2009.
- Hardt, Michael and Antonio Negri. *Multitude*. Campus-Verlag, 2004.
- Harvey, D. 2010, *The Enigma of Capital and the Crises of Capitalism*, London; Enigma Books.
- Hausman, Daniel M., and Michael S. McPherson. *Economic analysis, moral philosophy and public policy*. Cambridge University Press, 2006.
- Hearn, A., 'Meat, mask, burden. Probing the contours of the branded "self"', *Journal of Consumer Culture*, 8(2); 163-183. 2008.
- Holdsworth, P., 'John Murphy walks out the retreads', *Brand Management*, May 1, 2001, available at <http://www.highbeam.com/doc/1G1-74336433.html> , accessed 7/2- 2010.
- Hume, David. "Of money." *Essays*, London: George Routledge and Sons (1752).

- Illiceto, Michele, *La persona: dalla relazione alla responsabilità. Lineamenti di ontologia relazionale*, prefazione di Attilio Danese, Città Aperta, Troina (EN) 2008.
- Ingham, Geoffrey, “Babylonian Madness’: on the historical and sociological origins of money”, in Smithin, John, *What is Money?*, London: Routledge. 2000.
- Kennedy, Margrit I., Bernard A. Lietaer, and John Rogers. *People Money: The Promise of Regional Currencies*. Triarchy Press Limited, 2012.
- Keynes, John Maynard, *A Treatise on Money*, in *The Collected Papers of John Maynard Keynes* Vol. V. London : MacMillan St. Martin’s Press. 1971.
- Kittler, F., *Discourse Networks 1800/1900*, Stanford,; Stanford University Press. 1990.
- Landes, D., *The Unbound Prometheus. Technical Change and Industrial Development in Western Europe from 1750 to the Present*, Cambridge; Cambridge University Press. 2003.
- Lapavitsas, Costas, *The Social Foundations of Markets, Money and Credit*, Routledge, 2003.
- Latour, B., 'Never too late to read Tarde', *Domus*, October, 2004. available a http://www.bruno-latour.fr/presse/presse_art/GB-DOMUS%2010-04.html accessed 16/12- 2010.
- Latour, B., 'From realpolitik to Dingpolitik', eds. Latoru, B. & Weibel, P. *Making Things Public. Atmospheres of Democracy*, Cambridge; MIT Press, pp. 14-43. 2005.
- Lev, B., *Intangibles. Management, Measurement and Reporting*, Washington (DC); brookings Institution Press. 2001
- Levitt, T. 1983, ‘The Globalization of Markets’, *Harvard Business Review*, May-June.
- Levy, S., “E-Money”, *Wired USA*, Issue 2.12, 1994.
- Lietaer, Bernard, Christian Arnsperger, Sally Goerner and Stefan Brunnhuber, *Money and Sustainability - The Missing Link*, Triarchy Press, 2012.
- Lietaer, Bernard, Robert Ulanowicz, Sally J. Goerner and Nadia McLaren. “Is Our Monetary Structure a Systemic Cause for Financial Instability? Evidence and Remedies from Nature”, in *Journal of Future Studies*, Special Issue on the Financial Crisis (April 2010).
- Lietaer, Bernard, in collaboration with STRO (Social Trade Organization), “Commercial Credit Circuit (C3) - A Financial Innovation to Structurally Address Unemployment”. PDF Publication: http://www.lietaer.com/images/C3_BAL_diagram.pdf. Visited on May, 10th, 2010.
- Lietaer, Bernard, Robert E. Ulanowicz, and Sally J. Goerner. (2009). Options for Managing a Systemic Bank Crisis. *Sapiens*, 2 (1). Available online at <http://sapiens.revues.org/index747.html>
- Lietaer, Bernard, *The Future of Money*, London-NY: Randomhouse. 2001.

- Lietaer, Bernard, *Mysterium Geld: Emotionale Bedeutung und Wirkungsweise eines Tabus*, Munich: Riemann Verlag, 2000.
- Linnebaugh, P & Rediker, M., *The Many-Headed Hydra. The Hidden History of the Revolutionary Atlantic*, London; Verso. 2000.
- Liu, A., *The Laws of Cool. Knowledge Work and the Culture of Information*, Chicago; The University of Chicago Press. 2004.
- Lockley, L., 'Notes on the History of Marketing Research', *The Journal of Marketing*, 14, 733-36. 1950.
- Lury, C. & Moor, L., "Brand valuation and topological culture", eds. Aronczyk, M & Powers, D. *Blowing up the Brand: Critical Perspectives on Promotional Culture*, New York; Lang. 2010
- Maffesoli, M., *The Time of the Tribes. The Decline of Individualism in Mass Society*, London; Sage. 1996.
- Mance, E. "Solidarity-Based Cooperation Networks." *January*, available at < vision.socioec0.org/en/documents.php (2003).
- Mandel, M. , Hamm, S. & Farrell, C. „Why the economy is a lot stronger than you think“ *BusinessWeek*, 13/2, 2006 (available at http://www.businessweek.com/magazine/content/06_07/b3971001.htm accessed 25/11-07.),
- Marazzi, Christian, *et al.*, "La Moneta nell Impero", *Ombre Corte*, 2002.
- Marvick, A. & Boyd, D., 'I tweet honsetly, I tweet passionately. Twitter users, context collapse and the imagined audience', *New Media and Society*, Online, July 7, 2010. 2010
- Marwick, A. Murgia-Diaz, D. & Palfrey, J., 'Youth, Privacy and Reputation', Paper No. 10-29. *Harvard Law School Public Law & Legal Theory Working Paper Series*. 2010
- Marx, Karl 1867 (1976). *Capital*, Vol. I, London: Penguin/NLR.
- McLuhan, Marshall, *The Medium is the Massage: An Inventory of Effects*, with Quentin Fiore, 1st ed. produced by Jerome Angel. Randomhouse. 1967.
- McKenzie, D. *An Engine, Not a Camera: How Financial Models Shape Markets*, Boston; MIT Press. 2006.
- Menger, Karl G., *Principles of Economics*, New York: New York University Press. 1871/[1981].
- Menger, Karl G., 'On the Origin of Money', *Economic Journal*, 2, 239–255. 1892.
- Miller, V. 2008, 'New Media, Networking and Phatic Culture', *Convergence*, 14(4), pp. 387-400.
- Mitchell, A., *Nine American Lifestyles*, New York; Warner Books. 1984.

Morris, Charles E., *The Two Trillion Dollars Meltdown: easy money, high rollers and the great credit crash*, Melbourne: Black Inc., 2009.

Morriz-Suzuki, T., 'Robots and Capitalism', *New Left Review*, I/147, 109-121. 1984.

Nakamoto, S., "Bitcoin: A Peer-to-Peer Electronic Cash System", Bitcoin website. 2009.

Nakamura, L. „Investing in intangibles. Is a trillion dollars missing from GDP?“ *Business Review*, 04/2001, pp. 27-37.

North, Peter, *Local Money - How to Make It Happen in Your Community*, Transition Books, an imprint of Green Books. 2010.

O'Hare, N., Davy, M., Bermingham, A., Ferguson, P., Sheridan, P., Gurrin, C., & Smeaton, A., 2009, 'Topic-dependent sentiment analysis of financial blogs', Paper presented at TSA'09, First International CIKM Workshop on Topic Sentiment Analysis for Mass Opinion Measurement, Hong Kong, Nov. 6, 2009.

Pang, B. & Lee, L. 2008, *Opinion Mining and Sentiment Analysis*, Boston; Now Publishers.

Pang, B., Lee, L. & Vaithyanathan, S. 'Thumbs up?: Sentiment classification using machine learning techniques', *Proceedings of the 2002 Conference on Empirical Methods in Natural Language Processing, EMNLP*, pp. 79-86.

Piore, M. & Sabel, C., *The Second Industrial Divide. Possibilities for Prosperity*, New York, Basic Books. 1984.

Quilligan, James, 'Commons Currencies,' available at <http://bit.ly/mP5ZE8> (

Roethlisberger, F. & Dickson, W., *Management and the Worker*, Cambridge (MA); Harvard University Press. 1939.

Rorty, Richard, *Philosophy and the Mirror of Nature*, Princeton, NJ: Princeton University Press. 1979.

Rose, M., *Industrial Behaviour*, Harmondsworth; Allen Lane. 1975.

Rushkoff, Douglas, *Life Inc. How the World became a Corporation*, Vintage, 2010.

Rutherford, Donald. 2007. *Economics - The Key Concepts*, New York - London: Routledge.

Sachy, Marco, 2012, "The empowering potential of complementary currencies and alternative payment systems", Silent University - Tate Modern and Delfina Foundation. 2012.

Salinas, G. & Ambler, T., "A taxonomy of brand valuation practice: Methodologies and purposes", *Journal of Brand Management*, 17: 39-61. 2009.

Screpanti, Ernesto and Stefano Zamagni, *An Outline of the History of Economic Thought*, second ed., Oxford: Oxford University Press. 2005.

Simmel, G., "Philosophie des Geldes", 1900. DigBib.org

Sini, Carlo, *Filosofia e Economia - O del viver bene* (approximative English translation: Philosophy and Economics - On the good life), Milan: CUEM. 2001.

Smart, B. ed., *Resisting McDonalidization*, London; Sage. 1999.

Smith, A.. *The Wealth of Nations*, Vol. I, II, E. Cannan (ed.), London: Methuen. 1776 (1904).

Smythe, D., 'On the audience commodity and its work', eds. Duham, M.G. & Kellner, D., *Media and Cultural Studies: Key Works*, Oxford; Blackwell, 2002, pp.253-279. 2002 (1978).

Stehr, N., Henning, C. & Weiler, B. Eds., *The Moralization of Markets*, London; Transaction Books. 2006.

Stiglitz, Joseph D., 'Moving Beyond Market Fundamentalism to a More Balanced Economy', *Annals of Public and Cooperative Economics*, Vol. 80, Issue 3, September, 2009.

STRO - Social Trade Organization, "The Commercial Credit Circuit (C3)". PDF Publication: <http://bit.ly/Zki3CO> (Visited on March, 21st, 2010).

Taleb, Nassim Nicholas, *Antifragile: Things That Gain from Disorder*, Random House, 2012.

Tarde, G., *Psychologie économique*, Paris; Félix Alcan. 1902.

Taylor, F.W., *The Adjustment of Wages to Efficiency: Three Papers*, London; Schonnenshein & co. 1896.

Thackara, John, *In the Bubble - designing in a complex world*. Cambridge MA: MIT Press. 2005.

Van Arkel, Henk, Social Trade Organization (STRO), 'Fighting Crisis and Poverty using Virtual Currencies', upcoming publication, 2013.

Veloso, F. & Kumar, R., 'The automotive supply chain: Global trends and Asian perspectives', Working Paper, Asian Development Bank, January. 2002.

Virno, P., *A Grammar of the Multitude*, London; Verso. 2004.

Vogel, D., *The Market for Virtue. The Potential and Limits of Corporate Social Responsibility*, Washington; Brookings Institution Press. 2005.

Watts, D., *Six Degrees. The Science of a Connected Age*, New York; Norton. 2004.

Wells, D.W., 'Foreword' ed. Wells, D.W., *Life Style and Psychographics*, Chicago; American Marketing Association, 1974.

Wells, W. & Tigert, D., 'Activities, Interests and Opinions', *Journal of Advertising Research*, 11, pp 27-35. 1971.

Weatherford, Jack McIver, *The History of Money from Sandstone to Cyberspace*, New York: Crown Publishers. 1997.

Williams, Jonathan, *Money: A History*, 2nd ed., with J. Cribb and E. Errington (London, British Museum Press, 1997.

Wray, L. Randall, *Understanding Modern Money: the Key to Full Employment and Price Stability*, Cheltenham: Edward Elgar. 1998.

Zwick, D. , Bonsu, S. & Darmondy, A., "Putting consumers to work. "Co-creation" and new marketing govern-mentality", *Journal of Consumer Culture*, 8(2):163-196. 2009.