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FORMS OF MONEY POWER AND MEASURE OF ECONOMIC VALUE. TIME BASED CREDIT FOR CARE AND COMMONS ECONOMIES

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ABSTRACT

Among the main causes of the current crisis, there is certainly a lack of adequate criteria to measure economic value, and this is linked to the way official currency value is designed, imbued with intrinsic and anonymous economic value. Official currencies perform their function of economic accounting only because they offer a general equivalent of all value (Marx), i.e. because they have an abstract and internal value, but this prevents them from being effective instruments of economic measure, making them unstable and relatively inexpressive of any concrete value.

Despite its importance in the current systemic crisis, the lack of instruments for measuring economic value has not warranted special attention in prevailing alternative currency schemes. This is partly related to a prevalence of approaches that limit attention to the social integration functions of alternative currencies and/or the exchange functions for reviving economic growth and full employment of resources. However, in order to restore the wider emancipative potential of alternative currencies and better address the current systemic crisis, we have to reconsider the economic measure problems mainly from the viewpoint of the links between human activities and the common conditions of existence, or life contexts, in which the flow of time has a fundamental influence.

KEYWORDS

Sustainable development; measure of economic value; Time Units; Care Economies; Commons.

1. INTRODUCTION

This paper is part of more general research on the relation between forms of monetary value/power and current systemic crisis conditions, manifesting particularly in the financing of public economies and care of commons. Public, Ecological, and Solidarity Economies (PESE) are grouped together in the search for more appropriate forms of finance, not only on the basis of the care principles that guide them, but also the specific experience of time on which they are based (Ruzzene, 2007; 2015). The experience of time as a natural and stable dimension that unfolds in the ambit of PESE, by virtue of their being regulated by care principles, contrasts with the organisation of time in capitalist economies, where the aim is the intensification of production and labour time towards maximum growth of monetary power. This is why in my preceding research I examined the development of systems of "nominative circular credits" in "natural physical time units" as the most effective and sustainable way to finance PESE, mainly to ensure the long-term stability of the credits and avoid payment of any monetary interest (Ruzzene, 2009; 2016). Here, time-based credits are mainly considered to account the value of natural resources and the activities that take care of them, with the aim of reinforcing the development of PESE and improving protection of environmental heritage and natural resources, whether renewable or depleting.

These last aspects are important because they can help tackle the increasing economic and ecological debt afflicting society today. The present debt situation (economic and ecological) is largely due to the increasing costs of reproduction of current socioeconomic systems caused by hypertrophic financial activity, increasing exploitation of every available resource and the resulting degradation of natural resources and environmental heritage (Gallino, 2011; Gesualdi, 2013). However, we cannot ignore the lack of adequate criteria for measuring economic value, a question that is felt in all three aspects indicated above and that particularly fuels undue growth of money, public debt and ecological debt.

Natural Resources and Environmental Heritage (NREH) are still largely at the mercy of styles of appropriation, use and consumption that oscillate between "public and free" and extreme forms of monetisation, or between impersonal monetary power relations and arbitrary socio-political powers. In all cases, there is generally a lack of measurement criteria and instruments that could establish sufficiently objective and shared systems of value capable of expressing not only the constraints of the generation and regeneration of natural resources and commons, but also the time and costs necessary to take care of and conserve them.

Recent decades have seen many articles and much research aimed at developing more adequate systems of measuring economic value, either of NREH and labour time. However, the results have often been disappointing and difficult to share, and there has also been too little contact and integration between ecological economics and AC approaches as we see in section 2.

The central hypothesis of this research is that the various objectives so far indicated can be achieved through the development of adequate measurement criteria and exchange relations based on natural physical time units, which cannot be framed in the concept of labour time. Measuring instruments based on natural physical time units can not only ensure stability of recorded credits and the development of long-term interest-free credit, especially for PESE. They can also account for costs sustained for the care of environmental heritage, for the generation and regeneration times of natural resources, as well as the conditions of their depletion.

Since like any other economic activity, the activities of PESE have to interact with economic and official monetary systems, a condition of commensurability between time units and official currencies is however needed. And this is achieved by reference to labour time of average value, since incomes from labour individual activity continue to be very important in capitalist economies (OECD, 2005). This involves some problems of commensurability between different economic values, but can greatly enhance the measurement and calculation potential of time-based systems, as we see in section 5.

Nevertheless, no innovation of the criteria of economic measure can help us achieve the indicated objectives if we remain in the framework of monetary exchange and credit systems having the same forms of value and power as

official currencies, in which value/power plays out an intrinsic, impersonal and anonymous power of command over goods, natural resources, and persons. Such characteristics make the value of money and related accounting systems fluctuate and fuel undue monetary growth, heedless of the environmental effects and of economic sustainability (as we see in sections 3 and 4). This mean that money value/power, currency, and the concept of economic wealth have to be conceived differently (Jackson, 2004; Greco, 2009).

More precisely, we need a different concept of credit and debt relationships that ought to reign especially in the framework of PESE in order to meet their specific needs. Some of these elements can already be found in certain alternative currency schemes, such as those based on interest-free circular nominative credits without a strictly monetary form (section 5). Other aspects, such as a sustainable reference to the natural or physical dimensions of time, implying "stability", and sufficient levels of "expressivity" of time-based systems of economic measure, need to be profoundly rethought, not only in economic but also in philosophical terms, as we see in next section.

A few preliminary words about the possibility of applying the principles of time-based nominative credits to the relationship between the planet that hosts us and individuals, organisations, countries and humanity as a whole, is also worthwhile (section 2). This can occur with reference to resource withdrawal and environmental degradation, on one hand, and care of commons (for protection and remediation of NREH), on the other. This would determine a gradual transition from an economy based on consumption of material goods to one based on conservation of commons, as envisaged in ecological economics (Daly, 1996).

Besides favouring responsibility and commitment on the part of everyone, it could also obtain a reduction in the senseless alienating work that prevails in economic systems aimed at monetary power growth, in favour of more fulfilling and interesting work, such as care of commons and environmental heritage (Ruzzene, 2007; 2012). Finally, if we extended the concept of care of commons to the public and political domains, we could activate a process of participated democratisation of current social organisation and the underlying division of labour, as foreshadowed by B. Théret (Théret, 2018). The process of re-democratisation would have ecological and economic advantages since it would be possible to reduce the high costs of intervention a posteriori imposed from above by specialists or public sector bureaucrats (Ruzzene, 2015), bringing care-related concepts back into economic and social activities, as envisaged among the main objectives of this research.

With regard to the approach adopted, it is clearly transdisciplinary: economic, philosophical and sociological, as any study on the constitutive conditions of existing monetary systems and on the possibility of changing them should be. Scenarios on the possibilities of change are partly based on intuition and reason, principally inferred from in-depth analysis of the functional and developmental conditions of existing socio-economic systems. However, I seek to go beyond constituted power relations, under which prevalent ideas on possible alternatives generally become mainstream. Such relations are destined to change periodically and I believe that the presentation of possible alternatives, even in theoretical terms, can influence the directions taken by processes of social change to some extent (as shown in a long-period historical perspective in Ruzzene, 2012).

However, the strongest support for the possibility of changing official monetary systems comes from analysis of the limits and incongruences that make them unsustainable, in economic, socio-ethical and ecological terms. This is why analysis of the constitutive conditions of official monetary systems, their limits and contradictions, occupy much of this text (sections 3, and 4). Section 2 contains a concise introductory reference to possible development of new, more sustainable tools and criteria for measuring the value of NREH, also for the purpose of contextualising subsequent more analytical parts.

2. ALTERNATIVE APPROACHES TO MEASURING ECONOMIC VALUE OF ENVIRONMENTAL HERITAGE AND CARE OF COMMONS

2.1 Accounting "ecosystem services": money versus natural resources

Since the 1970s, many attempts have been made to develop alternative criteria and tools for measuring the value of natural resources and environmental heritage (NREH) in the field of ecological economics. They were generally motivated by the failure of monetary accounting to include the environmental costs of economic growth and by the

desire to protect Natural Resources and Environmental Heritage (NREH), laying the foundations for more sustainable economic development (Bresso, 1993; OECD, 2000).

I shall not list the great variety of approaches developed. Here it suffices to point out some advantages and limits of the main approaches, distinguishing between physical (mono-factorial and multi-factorial) and "mixed" systems of measure, the latter combining physical and monetary criteria. I also look briefly at what can be called "qualitative" approaches, that state the incommensurability between physical and monetary factors, and seek to avoid the commodifying monetisation of NREH.

To assess the advantages and limits of the different approaches to measuring the value of NREH, I consider in particular the criteria of "stability" (or invariance of means of measure), "expressivity" (with respect to the content of the values measured) and "practicality" (of use or application) that any effective system of measure should have (Kula, 1986; Marradi, 1985). Another significant criterion is also "synthesis" (capacity to express many aspects of value formation), important in economic measures and especially in official monetary systems. The latter have high power of "synthesis", but only for factors (costs and values) that go to form monetary "power of command", while they have very little stability (i.e. they are highly variable) and almost no expressivity for non monetary values and costs, especially environmental (see section 3 and 4).

Among mono-factorial physical measures, energy is particularly important. It was first outlined in an alternative currency scheme already in the 1930s by F. Soddy (Soddy, 1934) and was picked up by ecological economics in the 1970s (Odum, 1971; Knees, 1977). While these approaches are rather "synthetic" and apparently simplify the measurement of economic processes (which are actually not easy to measure in energy terms alone), they have very low expressivity and practicality, whether for protecting NREH, for tackling questions of social equity, or for expressing economic values and issues (for more on the limits of energy measures in general, see: Kapp, 1983; Martinez-Alier, 1991. For limits to Soddy's approach see: Daly, 1996; Ruzzene, 2007).

In the 1980s, multi-factorial physical approaches were devised to overcome the limits of mono-factorial approaches (energy or money), especially in France (Archambault and Bernard, 1988). They proved useful for accounting many natural values and costs, and for defining detailed environmental constraints for the purposes of sustainable development. However, multi-factorial physical analysis and calculation is very complex and this was a big obstacle for widely shared application and for political use, mainly because the measures can only be fully appreciated by specialists (Bresso, 1993).

In the mid 1980s, many "mixed" approaches, which seek to combine physical and monetary measures, began to be developed for the purpose of increasing cultural and political impact. In some cases they offered promising results (for example, Daly and Cobb, 1989, was important for linking environmental and social sustainability; Costanza, 1991, presented several data and experiences and achieved wide resonance both academically and politically). Nevertheless, these approaches, especially the latter, also proved rather controversial. Various authors accuse "mixed" quantitative approaches of hiding the substantial incommensurability between money and natural resources, and especially of underestimating the influence that the power balance can have in the constitution of systems of measure for socio-economic purpose (Martinez-Alier and Munda, 1998; Robertson, 2011). Various authors point out that combining physical and monetary measures tends to monetise and commoditise NREH, as in the case of the more recent "ecosystem service" approaches, often used as a means to stimulate economic growth (pros and cons of these approaches are discussed in: Banzhaf and Boyd, 2012; Khavari, 2015).

A reply to such criticism is that the basic problem is the persistent waste and abuse of NREH, since the origins of capitalism, and these are not a consequence of trying to develop alternative systems of measure, conceived as a solution to indiscriminate exploitation of NREH. However, it should be highlighted that no alternative system of measure of NREH can be of much use unless sustained by styles of appropriation, exchange and credit completely different from those based on money. This implies reconciling new systems of measure of economic value with appropriate AC schemes, so as to disconnect them from the "imperialism" of official currency systems.

In truth, no satisfactory agreement has been reached on any synthesis or approach to alternative systems of measure for NREH and ecosystem service in mainstream research or political practice (Hammond and Matthwes, 2000; Grear and Kotzé, 2015). Economistic approaches have prevailed and these have led to monetisation, or calculations

expressed in official currency, of environmental damage and depletion of NREH, with disputable results in terms of environmental protection and equity between countries (Roberts and Parks, 2009; Gonzales, 2015). The question of ecological debt has also been declined in terms of buying and selling rights to acquire NREH and even to pollute them, confirming the tendency to backstage a question that is increasingly capturing attention. Ecological debt mainly regards the relation between present and future generations, and above all between humanity and the planet as a living organism.

2.2 Rediscovering natural time: labour towards care of commons

The problematical outcomes considered above may be the reason why Alternative Currency (AC) circles have shown weak interest in the need to develop new types of measure of economic value for NREH. Except for some sporadic attempts at energy approaches (Douthwaite, 2011; Sgouridis, 2014), AC research into new criteria of measure of economic value has been limited to labour time units. It originally revived ideas dating back to the first half of the nineteenth century, notably in certain anarchist and utopian socialist approaches, starting with R. Owen and P.J. Proudhon (North, 2010). On the other hand, K. Marx postulated the centrality of labour value in capitalist society, but contested the idea that it could be extended to an ideal future communist society, sustaining that only nature could be legitimately considered the ultimate basis for the formation of economic value (Marx, 1875).

Since the 1990s, reference to labour time has been particularly useful to AC for helping persons difficult to collocate occupationally, and for developing more equal and community-friendly relations on a local basis (Coluccia, 2001; Seyfang and Smith, 2002), whereas questions to do with public and ecological debt have remained substantially absent. In recent years, AC based on labour time have nevertheless become secondary, almost marginal, in comparison to scheme that concentrate on stimulating exchange functions and full use of resources (Ruzzene, 2016).

As in my previous articles, here I continue to attribute an important role to labour time units, especially in the process of commensuration of natural physical time units and official money through the concept of labour time of average value. However, to develop the enormous potential that time-based units can have for financing PESE and for attributing sustainable economic value to NREH, it is necessary to overcome the temptation to reduce time to mere labour time and to attribute economic value to time units. Official currencies can exercise their account functions only because they are bestowed with a proper internal and abstract value, i.e. because they offer a general equivalent for all existing values (Marx, 1857), but time units cannot be like this if they are to be stable and to sufficiently express the "content" of the value measured.

This basically means that it is necessary to make a clear distinction between the measure of economic value in physical time units and the processes of value formation. More precisely, we have to consider that the flow of time is simultaneously outside and at the basis (the constitutive and fundamental dimension) of any process of formation of economic value. As a simultaneously external and fundamental constitutive condition, the flow of time exerts its effect and permeates every human action (not only economic actions), as well as the general conditions of existence on Earth, by imposing the physical, natural and objective constraints of its stable regular flow.

Being without any value in themselves, natural physical time units can create a system of measure that is invariable, expressive (of the essential content of economic value) and also "synthetic". They can influence and express a multiplicity of factors and conditions playing in the formation of economic value, especially as far as PESE are concerned. I have in mind the costs and values related to "production" times of different types of public goods and services, the process of conservation of environmental heritage and repair of environmental damage (when repair is possible), but we can also refer to the times of generation and regeneration of natural resources, both renewable and depleting.

Obviously, other factors influence the formation of economic value. These may be institutional or subjective, such as perception of the scarcity or utility of goods, and particularly the balance of power and social dominion. The physical (not psychological) flow of time, however, has a crucial role in the formation of most economic value, especially for PESE, care activities and conservation of NREH. This holds also for non renewable and depleting natural resources because their impossible regeneration times can be (mathematically and economically) represented as infinite. If the reproduction or regeneration time of depletable resources is considered infinite, their economic or exchange value can also be considered infinite, making any reference to other factors that could influence the value

formation of a resource (such as consumer utility) irrelevant, thus precluding – in general economic terms - any appropriation, exchange or consumption of depletable natural resources.

However, the attribution of infinite value to depleting resources can be a condition for their care and protection only if we overcome the concept of currency as having an internal value; a value that enables appropriation and trading of any type of resource. It is necessary to adopt a credit and debt system based on observance of common vital needs and physical constraints regarding the effective availability of renewable resources in long term. Credit-debit relations should also extend to relations between humans and nature, as partly foreshadowed in ecological economics (Bresso, 1993), so that withdrawal of resources and reparable damage to the environment are neutralised by care activities and conservation of NREH. And credit should clear in a reasonable time, as occurs already in certain AC, e.g. LETS and certain barter schemes (Fantacci, 2009; Greco, 2013).

In a nutshell, agents would contract debt in time units when they withdraw renewable natural resources or when they cause reparable damage to the environment, and could acquire the credits necessary to withdraw new natural and environmental resources through activities that repair the damage caused, or trough care for and maintain NREH. Attribution of economic value to renewable natural resources would increase care activities for environmental heritage and reduce industries and consumption that pollute and waste natural resources. In the case of depleting natural or environmental resources (or irreparable environmental damage), withdrawal should be made economically unsustainable, excluding them from economic exchange or repayment of debt, as would occur if depleting resources (and irreparable environmental damage) were recognised to have infinite regeneration/repair times and hence an infinite exchange value.

Clearly, these aspects will have to be analysed in detail in future studies, especially concerning the possibility of extending systems of "nominative circular credits" to relations between humans and the planet. I only mention them here to better illustrate the analytical approach described below and to define its premises and intents. Now we consider the main features of official monetary systems, those related to the forms of value/power that give rise to many of the big systemic crises we have experienced so far.

3. CONNECTING "PER SE" VALUE OF MONEY/POWER AND "INTERNAL" VALUE OF CURRENCY

3.1 Eight features of the monetary value/power

Elsewhere I have already considered the relations between monetary forms of power and systemic crises, both economic and environmental. Here I shall only take up the salient aspects of my previous analysis, focusing on the inadequacy of accounting systems possible in official currency, and on how some models of alternative currency (AC) copy certain undesirable properties of official currency and can replicate the resulting crises.

First of all, I use the term "money power" mainly to indicate the "power of command" or purchasing power implicit in money (as "abstract wealth") or in any currency that represents it. The possession and exhibition of currency bestows the legal right to obtain a certain quantity of goods and services, and this legal right is simultaneously an instrument of command over things and persons, and an expression of the value of a currency. This is why monetary values represent a quantity of power and the terms currency and money are generally taken to be synonymous.

It is useful underline the distinction between the terms "money" and "currency" because such a distinction can help us to go more deeply into the nature of money and the different roles or functions that currency can play. More precisely, I use the term money to indicate the "substance" of economic commodified value, or abstract wealth, and the term currency to indicate the "medium", the concrete, material/symbolic embodiment and institutional form of money value/power (different interpretations of the terms money and currency can be found in: Wray, 2004; Ingham, 2004; Fantacci, 2005; Dodd, 2014).

As we all know, official currency performs a plurality of functions, such as medium of exchange, store of value and unit of account. However, the term currency is often also used to designate means of exchange and credit instruments without any store of value function, such as some of the AC, which are not proper money or abstract wealth. Worth noting that the purchasing power of a currency expresses its economic value, and is always its main requisite, whether it is an official currency or an AC intended to repudiate money as abstract wealth and its logic of social

command or domination. However, the fundamental question for us is not whether any currency necessarily has (or does not have) a command power as purchasing power. It is more important to focus on the essential characteristics of value/power entailed in different currencies or monetary systems, because as we shall see, such differences can have quite different socio-economic implications.

To define the characteristics of forms of monetary value/power in their essential, constitutive aspects, I draw mainly on ideas that can be traced to many of Marx's writings, especially "Grundrisse" (Marx, 1857-1858). Other (in particular Marxist) authors who developed major considerations on the effects of money in capitalist and even pseudo-socialist systems were also useful (see for example Lukacs, 1923; Rubin, 1928; Bettelheim, 1970; Napoleoni, 1971; Sohn Rethel, 1976). In a nutshell we can say that the value/power implicit in money and currencies of capitalist systems is characterised by at least eight features, that can be sorted into four groups.

I) In first place, monetary value/power (as abstract wealth) is considered: a) valid "per se", irrespective of values, constraints and purposes external to economic processes; b) "internal" to a currency as such, i.e. value/power belongs to currency, which is represented as an autonomous subject (almost a living being that can even "die" or expires when it loses all of its value).

II) As an autonomous subject, monetary value/power is: c) impersonal, and: d) anonymous, especially since it can circulate and impose its right to purchase or command (on goods, labour, natural resources etc.) regardless of the identity or intentions of the person holding it or exchanging it.

III) Monetary value/power also seems almost universally: c) convertible, and: d) fungible, being considered valid for almost all uses and purposes within economic systems.

IV) Finally, its dynamics and processes display: g) objective characters, that: h) unfold like physical or mechanical orders, i.e. they hold valid, irrespective of individual or collective will.

Although all these characteristics are significant, point I is the most important because "per se" and "internal" features of value/power lead to some of the main phenomena of systemic, economic and environmental crises. However, point II is also particularly significant, because impersonal and anonymous features of monetary value/power favour irresponsibility on the part of agents towards the undesirable consequences of money creation and use. Furthermore, anonymous feature of money tend also to favour spreading of obscure and criminal use of a currency, even when this is presented as an AC, like bit-coin, but this is an aspect that does not need to be explored here.

To have a clear idea of the meaning of the above statements, it suffices to look at systems which are not strictly monetary, such as LETS and Time Banks. In these systems, circular credit do not have a life of their own as an official currency, their value is not per se, anonymous and internal to the credit title, but rely on the kind and volume of goods and services exchanged (i.e. on the labour time necessary to produce and deliver them). They are registered "circular nominative credits" that disappear when the nominative credits and debts of any single person (and of all agents) balance. In some time-based exchange systems, such as the Fureai Kippu, individual nominative credits can last many years, enabling a long-term saving function (almost a "store of value" function, though essentially different). And even in this case, no currency or credit claim imbued with internal, impersonal and anonymous value/power is issued. Fureay kippu credit system do not develop a proper currency, but only a record of "nominative credits", although nominative credits also maintain a circulatory function and can be associated with a stable system of measurement of value, such as time units.

We focus on these issues in fifth section. Here it suffices to note that the internal value of a currency is not necessarily material but may be purely symbolic, ideal and conventional, as in official currency (fiat money), Bit-Coin and also in some other ACs. So the current absence of reference to gold and the purely conventional evolution of monetary values does not substantially modify the main characteristics and issues of official currencies, such as scarcity or proliferation of currency, speculative growth or loss of value, inflation, and many other undesirable effects.

3.2 Internal value of currency and crises of monetary systems

The feature of the value "per se" or "intrinsic" value of money (as abstract wealth) and the feature of the "internal" value of currency are usually taken to be the same thing. However, it is important to keep distinct them for at least

two main reasons. Firstly, the internal value attribute can affect certain models of ACs (with their unwanted consequences) even when they succeed in avoiding the value "per se" of money and of official currency. Secondly, features of per se value of money and internal value of currency can be associated with different types of crisis and problems (see Ruzzene 2016). Here I refer only to the more general aspects of crises involving capitalist systems, simply distinguishing external crises (affecting the natural and socio-cultural dimensions) and internal crises (mainly affecting the economic and monetary dimensions). Briefly, we can say that the per se (or "intrinsic") value attribute mainly implies environmental crises, while the internal value of currency mainly implies crises that directly involve economic and in particular monetary systems.

More precisely, the fact that monetary power comes to have value per se leads people to consider the creation and possession of money (and currency as imbued with abstract wealth) as an "end in itself". And this leads to indifference to the social uses of monetary wealth, as well as to the social cost and environmental implications of increasing amounts of money and currency in circulation. The fact that the currency circulating in any socioeconomic systems manifests as having an internal value tends, instead, to directly involve excessive emission of currency, significant loss of its value, and huge speculative attack on monetary values (Ruzzene, 2016).

Most current critical approaches to money are directed principally at the first aspect, namely the manifestation of monetary values as values per se or as "an end in themselves". It is generally underlined that manifestation as value per se leads people to consider money value-power as something to pursue at any cost, ignoring the implications and environmental (non-economic) costs of obtaining this power. And it should be quite evident why ignoring values and implications external to the capitalist economic dimension gives rise to systemic crisis, either in natural or social and cultural contexts (Napoleoni, 1976; Viveret, 2004).

Considering currency imbued with internal value has implications that may seem similar to the manifestation of money as having value per se, but it is significantly different and more controversial because it generates contradictions and economic crises that lead periodically to a questioning or downsizing of monetary power itself or to a loss of value of a currency.

In practice, considering monetary value as internal to currency makes agents increase their economic power by mere creation or adulteration of currency, whatever the basis or real conditions of its value (which may be related to a metal standard, or established by convention - usually habit - and today prevalently by financial markets). Thus, pressure for undue increase in the volume of currency does not lead solely to loss of the value of that currency. It manifests also in various inflationary phenomena, increased prices of goods and speculative financial bubbles, culminating in periodic partial destruction of the money supply or better the "monetary mass", including savings and financial high speculative funds (on general manifestations of financial crisis, see Rosier 2003; on more recent forms, see Aglietta and Rigot 2009).

Although the proliferation of currency imbued with internal value has implication principally within monetary systems, this does not mean that undue "inflationary" proliferation of currency is without heavy existential and environmental implications. Episodes of "inflationary growth" and loss of value of the currency in circulation not only increase the cost of living and cause the weaker classes to become poorer. Inflationary loss of value of currency also imposes exacerbation of exploitation of resources in every phase of capitalist development but especially in the service economy or in the tertiary phase (for economic meanings of the service economy and tertiary phase see: Lorenzi and al., 1980; Gadrey, 1992).

In previous papers, I analysed increase in the cost of living as the main crisis conditions specific to socioeconomic systems in the tertiary phase (Ruzzene 2005, 2012 and 2016) and I criticised interpretations of the current crises as "liquidity crises" (as such Keynesian interpretations are also prevalent in most alternative currency approaches). It is now well known that the current crises can be mainly explained as economic and ecological debt crises (Saleh 2009, Gesualdi 2013); and under such conditions, not only avoiding interest on currency but also saving functions become important, although most AC neglect this last aspect. Increasing debt can be linked to development of the savings function from several points of view. As indicated before, one is undoubtedly the lack of an adequate system for measuring economic value, and we need to deal with this aspect in depth.

4. SAVINGS, VARIABLE VALUE OF CURRENCY AND LACK OF MEASURE

4.1 Internal value of currency and variability in accounting value

It should be recalled that analysis of the type of measure of value associated with different forms of value is tackled here principally from the side of debt and the functions of interest-free credit considered prevalently in relation to the need to save human and natural resources. This should serve not only to reduce consumption of natural resources, but also for the re-investment of labour resources in developing more sustainable care activities, in particular those that pay more attention to protecting commons and environmental heritage, as is the case of public, ecological and solidarity economies (PESE). Saving and increasing social quality of labour resources should proceed in parallel with their fairer redistribution in the field of social production, and all this requires appropriate instrument for programming socio economic development (Ruzzene, 2012), as well as more stable and significant instruments for measuring economic value.

In my opinion, the question of the development of more adequate instruments for determining and measuring economic value needs to be reconsidered towards the above ends even in the field of alternative currencies (ACs), and I deal with these aspects in the fifth sections. Now we have to consider the limits of official systems of economic measurement in relation to the nature of value/power considered above, especially in relation to the attributes of internal value of currency.

Already the mere fact that currency is regarded as having internal value (which in addition takes the contrasting connotations of "exchange value" and "value per se") structurally prevents the monetary system from fulfilling the functions of genuine measurement – regular and sufficiently stable – of any economic value. This happen mainly because giving an economic value (particularly an exchange value) to a means for measuring economic value necessarily involves subjecting it to variations in value, and these must in turn be measured, requiring instruments and measurement criteria that cannot be found within the monetary systems themselves.

Basically, attributing an exchange value to currency, as occurs when it becomes a commodity (i.e. something that is bought and sold) means relegating it to perpetual variability, and this undermines the attribute of stability and regularity that should be the main characteristic of a modern and efficient system of measurement (Kula, 1987). Already for this reason we can say that since currency has internal and variable value it can only give rise to a system of account, a simple enumeration/count of the variability of exchange values (see Marradi, 1985, on the difference between "unit of measure" and "unit of account"). And this kind of accountability cannot tell us anything stable or univocal - whether quantitative or qualitative - about the type or concreteness of economic values accounted.

More precisely, official currency can account for a series of variations of monetary values of goods and services exchanged, as well as of variations in the exchange value of currency itself. It not only cannot provide a stable regular measurement of existing economic values, whether considered overall or singly. It also cannot establish solid limits and constraints to lay as a foundation for a sustainable development of economic processes.

As C. Bettelheim rightly showed in "Calcul économique et formes de propriété", capitalist systems cannot structurally develop instruments for measuring the value of goods - but indeed can only account for variability of their exchange values - also because economic values impose themselves as abstract wealth. In fact monetary values do not refer directly to any concrete or particularly significant reality, or to any well defined "use value", or even to readily detected physical quantities and processes that could enable them to be significant for ordering and orientating most economic activities (Bettelheim, 1970). Monetary values refer directly to "power of command" on goods and services, but this economic power don't rely on any concrete value, resource or work, as it mainly rely on rather arbitrary levels of currency creation, or on always changing dominance relations between social agents (Aglietta, 2008; Gallino, 2011).

Reference to adequate conditions of "economic significance" seems necessary for any system of values that aims to account today for essential conditions constituting the material basis of existence and the economy that should sustain it. This is even more necessary in order to establish a "sense of measure" that can also identify precise limits and boundaries for production and consumption, especially so as to consent levels of equilibrium with respect to external reality (environmental and natural resources that can be or not reproduced in the long period).

All this means that the basic problem does not lie solely in the fact that currency manifests as having internal value, nor that it is a commodity having an exchange value. The problems lies above all in the lack of identification of a system of measure that must act "outside" the system of current economic values: even to be able to adequately measure the many variations in economic values themselves, by relatively stable criteria that have to express many relevant, concrete economic meanings. And such constellations of meanings and values must be significant or important not only for an adequate existence for human beings but also to defend the conditions of life in general.

I should add that in the current phase, with abandon of any stable basis for the determination of monetary values and with the faculty to arbitrarily establish the value of currencies consigned to markets and speculative agents (Akerlof and Schiller, 2009), the system has not only definitively liquidated the possibility of reaching a stable and meaningful measure of economic value. It also has undermined the unceasing growth of the "monetary mass" (stock and flow), and its accounting, of any economic rationality, by now functional only for the creation and reproduction of privileges and monetary rents of dominant groups.

More precisely, the differences (or "differential increments") that can be recorded in variations of monetary mass now only account for the trend of differences in power of command, i.e. in relations of supremacy between agents, individuals, social groups and whole countries, especially in relation to the creation and financial management of increasing in monetary flows (Aglietta 2008; Gallino 2011). In addition, these relations are not only completely variable but also mainly speculative, i.e. essentially accidental and subject to arbitrariness and abuse (Akerlof and AShiller, 2009).

4.2 Not "store of value" for interest but saving for care

As a result of all the above mentioned reasons, it is not so easy to recover an adequate "sense of measure", or a system for measuring economic values and processes, simply by establishing the primacy of exchange relations over store of value functions, or excluding the store of value function from alternative currencies (as M. Amato seems to suggest in "L'enigma della moneta", and as many proponents of ACs today sustain).

Prevailing ACs not only correctly exclude the store of value function and the traditional concept of currency. They also exclude saving problems from the AC perspective, by effectively ignoring the problem of public and ecological debt. To tackle this problem we should certainly not rely on the store of value function, because it is inextricably linked to currencies with internal value, which need to be transcended (one reason being that they lose value and are associated with payment of interest). However, a sustainable new look at the problem of saving natural and human resources calls for the development of an adequate system of measure and of non-monetary credit, which must not only be stable but must express the problem of the scarcity of resources and the need to maintain and care for the environment.

The problem of the connection with dominant capitalist economies and monetary systems must, however, be tackled, because current debt, especially public debt, prevents the balanced sustainable development of care of commons. Before looking at how certain tools developed by ACs can help us tackle this problem, it is useful to briefly name the three crucial aspects before us:

- commutation (in time units), protection and enhancement of savings set aside by individuals for their pension and social security;

- interest-free alternative financing of the public, ecological and solidarity economies (PESE), to free them from increasing debt and dependence on the global financial system;

- contribution to redeployment of resources used in the production and consumption of commodified goods in favour of PESE, which can develop more meaningful and rewarding labour activities and better conservation of common goods.

Elsewhere I dealt with the advantages possible for individuals and the community from financing PESE and developing a fair pension system in time units, without interest and monetary rents (see Ruzzene 2009, 2013, 2015). Within the limits of space of this article, now I concentrate on the contribute that the development of AC can offer to reduce the ecological debt.

If we only consider debt in economic terms, it increases inexorably due to the structure of monetary systems (i.e. excessive ed iniquitous interest rate) and the unfair distribution of wealth. However, ecological debt also increases due to an individual and collective tendency to over-consume goods and natural resources (Gesualdi 2013), and it is necessary to find new measurement instruments to link consumption to the real availability not only of natural resources but also of labour.

Of course debt cannot be criticised in itself, and can be considered a constitutive condition of human and social existence (Théret, 2008). Nevertheless, unlimited increase of debt is unsustainable and should be avoided as it can threaten the conditions of life on the planet, leading to loss of freedom and to enslavement of individuals and collectivities by owners of capital and monetary instruments, among others. This should be emphasised, it is not a question only of subordination of productive and financial activities to profit. It is also a question of the unsatisfactory manner of determining economic value and its accounting.

We can say that today these problems seem beyond the reach of any existing monetary system, including AC. However, we also need to examine the limits and potential of the main alternative currency models from the point of view of an alternative, more sustainable measurement of economic value of natural resources and environmental heritage, as we outlined in section 2.

5. PROBLEMS AND LONG TERM PERSPECTIVES OF ALTERNATIVE CURRENCY

5.1 Problems related to the internal value

In the previous sections, we saw that considering currency as having internal value involves various problematical aspects that favour a whole series of structural crises, especially economic, and prevent the development of adequate criteria for measuring economic value. These aspects also afflict those alternative currencies (ACs) that manifest the characteristic of internal value, i.e. currencies that ostensibly have their own, impersonal and anonymous value (or they do not manifest as "nominative - circular credits", the existence of which depends on labour and exchanges of good and services between the subjects who generated the credits).

Critical implications that may be associated with ACs having internal value are similar to some of those evident in systemic crises of official currencies, such as undue growth of currency and consequent loss of its value (Ruzzene, 2016). ACs generally can be forged more easily than official currency. Moreover, legal problems are almost inevitable because the creation of parallel currency having its own - internal - value is generally banned by existing legislations. These problems arise above all when ACs increase in size, as in the case of the Argentine Trueque (as we can see in Gomez 2012). Nevertheless, legal problems also depend on how specific laws are created and applied in different countries. In Italy, for example, even small AC experiences have been prosecuted when they issued currency with a certain internal value, as in the case of the SIMEC and the Eco Aspromonte (more on these experiences in Perna, 2014). This may be one reason why mainly exchange and credit systems based on "nominative circular credit", such as time banks and the barter system Sardex, are particularly developed in Italy.

Elsewhere I considered the reasons why some ACs tend to reproduce the attributes of internal value of official currencies, giving rise to anonymous or impersonal means of payment (Ruzzene, 2016). This can happen independently of their duration (i.e. currencies based or not on demurrage), their physical form (printed, purely immaterial or virtual) and their functions and aims (complementary, local or community currency). I also indicated how problems related to the intrinsic value of currency can be avoided by exchange and credit systems based on "circular nominative credits" principles, such as some LETS, time banking and clearing credit systems. However, even rigid development of such systems leaves certain problems unsolved, especially the problem of identifying appropriate, sustainable criteria for measuring economic value in general.

In clearing credit models prevailing in some commercial barter, such as Sardex, the problem of measuring the value of goods and services is generally solved simply by reference to official currency. This is replaced by circular nominative credits that have an annual deadline, when in any case debts have to be paid in official currency (Dini and al., 2014). However, in this way the model only promotes economic exchanges and short term credit. It does not seem able to tackle the problem of long-term credits free of interest, or to fix adequate environmental constraints on

economic activity, nor to establish appropriate principles of equity in the determination of exchange values of goods and services (Ruzzene, 2016).

5.2 On potentiality of time-based nominative mutual credit

By contrast, some LETS and Time Banks seem able to tackle most of these problems by using time based credits, but they encounter limits to become widespread, mainly due to the rigidity of their exchange principles (North, 2010; Cooper 2013). Furthermore, they can encounter difficulty with converting costs sustained in official money into time units, and such problems are commonly cited to claim the economic unsustainability of time based currency. Both problems however have already been tackled in exchange systems based on a more complex concept of accounting in time units. I refer in particular to the experiences of Ithaca Hours and Fureai Kippu, well known to scholars and activists in the field of alternative currencies (Lietaer, 2001; Hayashi, 2012).

In a nutshell, it can be said that such experiences solved the problems encountered by some LETS and time banking by two types of measures. Ithaca hours experience fix an average social value for labour time unit (i.e. the monetary value of an average valued hour of labour, which always corresponds to one hour in physical terms). The Fureay Kippu system separates the problem of determining or fixing a variable exchange value for care services from the problem of developing a stable unit of measurement for any economic value. I.e., exchanges of care services are all accounted in standard and stable time units, whereas the exchange value of the different care activities can significantly vary according to many factors (see Hayashy, 2012).

Above all, the distinction between the measurement of economic values (in time units) and the determination of exchange values (that can be defined in time units or in official currency) is fundamental, not only for developing the principles of time based currency but also for solving some of the loss of value problems afflicting ACs. I have already considered the social and economic implications of the two solutions used in the Ithaca Hours and Fureai Kippu experiences, and the enormous possibilities they offer for the development of the long-term credit systems (Ruzzene, 2014; 2015).

Here it suffices to outline that by using average-valued labour time units as a benchmark and distinguishing between determination of exchange value and measurement of economic value (in time units), we can:

- account all costs sustained in official currency (whether for labour, machines or different types of resources) and convert them into time units (or vice versa);

- maintain the regulatory function carried out by the formation of variable exchange values for goods and services (mainly to obtain a balance between supply and demand);

- develop systems of credit in time units that are invariant in the long term and do not require any payment of interest (and interest free credit can be very important for financing PESE and public debt and to convert official currency in time unit credits, as outlined in Ruzzene, 2013 and 2015).

Overcoming currency imbued with internal value and developing a “quasi-currency” (circular nominative credit, which is “de facto” simply a unit of measure) can help us to protect circular credit from any loss of value and speculative attacks. In such “quasi currency”, value is not internal or inside a “circular credit note” but resides in goods or use values, and in work already done, exchanged and recorded in time units. Furthermore, time based nominative credits can set an invariable unit of measure, unassailable by speculative attack, because “time scale” has a physical, invariable regularity. Finally, on this basis we can also organize the conditions for a better system of measuring the economic value/cost of care of commons and of consumption of natural resources, as outlined in section 2.

6. CONCLUDING REMARKS

The development of systems for measuring economic value in time units can play a fundamental role not only in each of the above-mentioned fields. It can also help tackle a problem that will soon be crucial for the sustainability of alternative currency systems: the problem of exchange between - and possible integration of - alternative currency systems and networks that wish to maintain organisational autonomy and their grass-roots nature, but need

larger volumes of exchange in order to be sustainable in economic terms (for more detailed considerations on this see Martignoni, 2015).

Elsewhere I have indicated how credit systems in time units can be adequately developed between different countries with different levels of productive development, by linking natural time units with units of average-social valued labour (Ruzzene, 2009; 2014; see Mance, 2016, for a more complex approach, based on the calculation of purchasing power in different country). Such hypothesis will have to be carefully weighed, but can found some significant confirmation in recent attempts to develop exchange and integration processes between different AC systems within the Integral CES network (see https://docs.integralces.net/dox/en/index.html).

These experiences are especially interesting because they seek to tackle the problem of the small size of many ACs by envisaging the possibility of developing exchange relations between different systems on the basis of time units, which can be converted into official currency, by reference to the average economic value of an hour of work in the cooperative sector. Furthermore, these experiences are important because they seek to establish criteria for interchange between different systems in order to make exchange relations and economic integration processes more sustainable in the long term, favouring the solidarity and ecological economies (see https://sistemaeconomic.monedasocial.cat/documentacio-economica/).

Contrarily to common belief among detractors of time based currency, measurement systems in time units can help to constitute the most powerful, stable and significant conversion system for all monetary values, including official currencies. Such condition could be particularly important because time based units can guarantee the anchorage to credit systems that do not lose value even in the long term, and this can make more convenient to convert official currency in time unit credit, both for individual and the community (see Ruzzene, 2012; 2015). We have seen that all this is made possible by reference to the social average value of labour time, and by the distinction between "measurement" of economic values and the matter of their "formation". Finally, the nominative mutual credit revolution can not only help us overcome the anonymous and impersonal features of monetary value, but also help us avoid problems related to internal value of currency.

As I have already pointed out, time has no value, neither per se value nor exchange value. In the formation of the exchange value of goods and services, the flow of time (especially time worked) is only one of the many factors (including usefulness, scarcity, and above all social power relations). Nevertheless, the flow of time can provide the most solid, expressive, objective and stable instrument for measuring (not for always determining) economic value, simply because it is the unchanging framework or universal context for the unfolding of any activity regarding production, consumption, generation or dissipation of resources. Average valued labour time can instead be the best medium for converting monetary value in time units, because labour time is the major factor in the formation of the exchange value of goods and services, also or mainly in the advanced tertiary and automated society (Gadrey, 1992; OECD, 2005).

Power relations too count in the formation of exchange value of resources and goods, and power relation are particularly relevant when attributing an economic value to scarce and non-reproducible natural resources. However, being able to count on a more solid and significant system of measure of economic value can help shift power relations and conflicts to a more broadly shared point of view, favouring common goods and general interests rather than particularistic and individual will.

To conclude these remarks, we can retain that rejecting dominant forms of monetary accounting in favour of economic measurement in time units can offer significant advantages despite all the difficulties encountered in the formation of exchange values for such resources. However, significant advantages can only be obtained if we go beyond the conception of currency as having intrinsic and internal value, towards a system of "circular nominative credits" in time units. And such system must tend to balance out, leading to a periodic clearing of debts, as should occur in any well managed clearing credit system (Amato and Fantacci, 2009; Greco, 2013). The time within which credits and debts are cleared cannot however be the short periods dictated by the current dominant economic system.

Reference must necessarily be made to the human life span (individual and intergenerational), as well as to the times required to regenerate environmental heritage. Moreover, credit criteria and constraints that can work in

individual relations are not the same as those between individuals and social institutions or the planet. In these relationships, the long-term saving and credit function (for all resources, economic and natural) should enable investments that can truly improve future living conditions: when people can no longer work and need to be helped and cared for; when future generations are faced with more difficult environmental conditions.

Again, these are very complex questions, but it should be clear that they can no longer be entrusted to official economic evaluation and monetary accounting. I believe that these issues deserve to be re-considered, also from the perspective of development of more sustainable AC schemes even if alternative currencies are mainly supposed to act locally and to be implemented at grass root level. Indeed, it seem plausible that a link to broader values, ideals and projects that can be shared by most humans and communities, can also help the development of AC even when they mainly act on a small scale.

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