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**UNPACKING MONETARY COMPLEMENTARITY AND COMPETITION:
A CONCEPTUAL FRAMEWORK**

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Abstract

Opposing approaches to money competition that state that all monetary forms are substitutes, theories of complementarity state that some can be complementary. This text analyses the ways in which monies can be linked by drawing upon the variety of so-called contemporary community and complementary currencies (CCCs). It considers four basic binary relations between monetary assets: commensurability, convertibility, co-use and coincidence of spheres of uses. Through their combinations, four means of linking monies are identified: substitutability, simultaneity, supplementarity and autonomy. On this basis, unpacked competition and complementarity do not oppose each other but appear to be related. The less forms of money are built on specific social values, the more complementarity may be pervaded by competition. This paper illustrates how this framework can be used with cases of the Argentine *Trueque* (“barter”) and the French experimental SOL. Both experienced difficulties that show the complexity of the links, possible shifts and their effects on the sustainability of the schemes.

Keywords

Money. Monetary plurality. Complementarity currencies. Competition.

JEL classifications

B52 – Current heterodox approaches / Institutional, Evolutionary

E42 – Money, interest rates / Monetary Systems • Standards • Regimes • Government and the Monetary System • Payment Systems

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UNPACKING MONETARY COMPLEMENTARITY AND COMPETITION: A CONCEPTUAL FRAMEWORK

1. Intention

Socio-economic and institutionalist approaches to money have experienced considerable new developments over recent decades. Among them, one might emphasise the following line of enquiry. By distinguishing between all-purpose and special-purpose money, Polanyi (1957) has successfully accounted for the existence of money in non-Western societies and helped discard the barter fable (Servet, 1994). Anthropological works published by Parry and Bloch (ed., 1989) have put Western conceptions of money into perspective by comparing them with representations and the institution of money within non-Western societies. By working on the social earmarking of monies in the United States, Zelizer (1994) has broken away from the myth of money viewed as a mere quantitative, interchangeable and impersonal instrument. By rehabilitating the ethical and hierarchical dimensions of public faith in money that economics neglects in favour of its mere inter-individual dimension, Aglietta and Orléan (eds, 1998) have helped to show how the purely economic approach is ill-suited to understanding this object in its essence. The book edited by Théret (ed., 2007) extends these works by showing how monetary crises cannot be understood with by using economic conceptual tools alone. A certain convergence of economic, sociological, anthropological and historical works has enabled such developments. For an economist, this means drawing on heterodox and, more precisely, institutionalist views on money, in that the latter are open to other disciplines' concepts and methods.

In this type of research on money, an important line of enquiry has triggered reflection on the plurality of money. Recent collective works on monetary crises with a wide range of historical and geographical cases show the importance of monetary plurality as both a driver and a consequence of crises (Théret, ed., 2007). But, beyond crises, one finding concerned identifying as possibly normal and sustainable the coexistence of such plurality even within modern societies (Blanc, 2000). Eventually, beyond the very forms taken by money and various units of account, sociological and anthropological works show the wide variety of ways money is used, with this now being an important area of reflection in social studies and sociology (e.g. Zelizer, 1994; Parry & Bloch eds, 1989; Guyer, 2004). Overall, it should be noted that, in the last two decades, works dedicated to rethinking the fundamentals of money have had to face up to this diversity, either through dramatic cases of national currency crises, or through

booming complementary and community currencies (e.g. Ingham, 2004; Cohen, 2004; Maurer, 2005; Dodd, 2014). Crises reveal the nature of money (Théret ed., 2007), as do monetary innovations, be they social or technological.

Seen from an economic viewpoint, monetary plurality seems to be like a “spectre” that haunts contemporary monetary theory (Blanc et al, 2013). According to theories that postulate monetary unicity, plurality is nothing but the result of crises, a pathology to be treated: typically, the dollar chases the national currency out during strong or lasting inflationary episodes. The long series of works on “currency substitutions” from the 1970s to the 1990s displays competition as the key mechanism of such plurality (e.g. Girton & Roper, 1981). Other theories are based upon monetary plurality as a desirable monetary organization, and in that case the main driver of this plurality is still competition between monies or currencies (Blanc et al., 2013). Competitive approaches to money state that monetary forms are substitutes, so that (rational) agents exert (rational) choices in order to decide on the money they use. However, there is no conceptual analysis of competition in most of these writings: competition is postulated as the normal way of articulating currencies when no legal restrictions prevent it.

However, a series of new approaches to money put forward the complementarity dimension in order to explain the coexistence of various types of money. Historically, theoretically and even doctrinally, in an increasing number of works, what appears clearly besides competition is indeed the idea of complementarity. Fantacci (2005, 2008) and Kuroda (2008a, 2008b) developed this point from historical analyses and case studies, in Europe as well as in Asia, providing insights into what could be a theoretical approach to complementarity. Moreover, from a theoretical and doctrinal viewpoint, much has been published since the 1990s with respect to the spread of so-called community and complementary currencies (CCCs). A widening corpus of texts has developed a vision of complementarity that promotes such currencies: they are not intended to replace national currencies (although the latter are highly criticized) but to complement them in order to build healthy societies and economies, if not the environment (e.g. Greco, 1994; Solomon, 1996; Lietaer 2001; North, 2010; Lietaer et al, 2012). However, there is no conceptual analysis of “complementarity” in most of these writings.

While orthodox economics mostly builds its analysis on competition between currencies that legal restrictions may prevent, heterodox economics does not rely on a common conception of how different monies interact. Money mostly appears unified, under the state’s lead (Chartalists) or through debt-driven bank money (Post-Keynesians). Monetary plurality lies mostly outside the scope of these approaches, with

the exception of crises, which generate a plurality of currencies that should be cured. Bell (2001) analyzes the plural nature of debts in the economy and, consequently, a plurality of monies. Their homogenization is ensured by a hierarchical order of banks. The possibility of monetary plurality outside cases of monetary crises and analyses of layers of debt is scarcely taken into account by heterodox frameworks.

This article attempts to fill the gap through using a systematic analysis of the links between monies. It develops the hypothesis that there is a conceptual necessity to go *beyond* the idea of competition and complementarity conceived as opposites, and attempt to refine the ways monies are linked, by unpacking competition and complementarity. It aims to build a systematic view of these means, starting with general categories of possible relations between different types of money, and thereby deepen the institutionalist approach to money. For the purpose of this analysis, money will be considered as a social institution that, in particular, takes the form of a system of objects embedded in a system of values. The links between objects, the understanding of which constitutes the core of this paper, cannot be reduced to a mere issue of quantities, as will be seen.

While the theoretical argument of the paper is intended to be general, it will draw upon rich and varied cases of CCCs (for an overview, see Lietaer, 2001 or North, 2010; for a classification in four generations, see Blanc, 2011). The founding case is that of “Local exchange trading systems” (LETS), first created in 1983 on Vancouver Island: they will be referred to as “Canadian LETS” throughout this article. LETS are based upon a mutual credit principle: “A mutual credit system operates not through money as the initiator of exchange but through exchange as the creator of a debt or credit” (Hutchinson, Mellor and Olsen, 2002, p. 188). The unit of account of LETS in Anglo-Saxon countries is mostly fixed at par with the national currency, which enables price comparisons and trade-offs and makes it possible to pay for goods or services with a combination of LETS units and the national currency. However, non-Anglo-Saxon LETS frequently separate their unit of account from the national one and promote accounting in hours of time, like French SELs, although exchanging goods makes it impossible to fully implement this valuation principle. This is precisely what is radically implemented in “time banks”: systematic time accounting of services provided by members. In Argentina, an adapted form of LETS led to the implementation of so-called *trueque* (“barter”) schemes, replacing the mutual credit system with paper notes allocated to new members. These notes were denominated in *créditos* that were first at par with the peso. They could be used in specific marketplaces. Local currencies, starting in 1991 with the Ithaca HOUR’s case (which should not to be confused with a time-banking scheme), are paper currencies that first link consumers with traders and producers of a district, a city or a small region. Eventually, rewarding currencies (often

based on chip cards or electronic formats) started to be implemented at the beginning of the 2000s in order to change consumer behaviour towards a more environmentally-friendly approach, as with the NU-Spaarpas in Amsterdam (Sambeek and Kampers, 2004).

Section two presents the basic framework enabling discuss about the links between a plurality of monies. Four criteria have been identified: commensurability, convertibility, co-use and coincidence of spheres of uses. Their combinations help to define, in section three, four means of linking monies: substitutability, simultaneity, supplementarity and autonomy. Consequently, competition and complementarity are shown to be complex and interactive. Section four mobilizes this conceptual framework through a synthetic examination of two cases of CCCs which experienced difficulties, showing the complexity of interaction, the possible deviations and their potential effects on the sustainability of the schemes: the Argentine trueque and the French experimental SOL. Section 5 concludes and summarizes the categories that have been built.

2. Binary relations between monies

This section is intended to contribute to a relevant conceptual framework through discussing a set of binary relations between monies. It is firstly based on the assumption that money does not only refer to quantity but to qualities as well.

2.1. Monetary qualities

Monetary qualities are often acknowledged, but are hardly integrated as such in an economic theory of money. Four qualities can be identified. As a general institution for solving debts measured by a unit of account, and made concrete and useable in payments through a variety of means of payment, money (*i*) takes on specific monetary forms, (*ii*) is inserted into symbolic universes, (*iii*) conveys socio-economic earmarking that guide its uses and (*iv*) is characterized by a certain authenticity. The last two qualities will not be considered in this discussion because they are not directly related to the core of our argument¹.

(*i*) Money is made concrete and useable in payments through specific forms that can vary greatly. “Monetary forms” refer to the various monetary instruments that can be used as means of payment by non-financial agents. Contemporary monetary forms include metal coins (whose legal tender greatly exceeds the commercial price of their metal content unlike erstwhile monetary systems), paper money and electronic forms of money (bank deposits) that can be used through cheques, cards and other payment

¹ For an extended view on qualities of money, see Blanc (2013).

schemes. Today's CCCs generally rely on circulating paper (e.g. local currencies), written accounts (e.g. LETS and time banks) and, increasingly, electronic forms of accounting and transfer (through online software such as Cyclos for LETS-like schemes, SMS payment systems for local currencies, etc.). With regard to monetary forms, not only the material (e.g. the note or voucher made of paper) should be taken into consideration but the way it is shaped and the symbols and information it conveys (e.g. bridges and doors on euro banknotes), since all these elements make this form a particular one, differentiated from others — should this make a difference in its value or not.

(ii) The great diversity of means of payment may erroneously lead to defining money on the basis of circulating media. Yet, this diversity is ordered by the unit of account, which constitutes the foundation of money, as Keynes and State's theories of money put it. Ingham defines a "monetary space" by money of account and relates it to sovereignty, be it national or not (Ingham, 2004, p. 71). In this framework, the notion of "symbolic universe" tries to capture a key feature of monetary spaces: economic valuation, rendered possible by the unit of account, requires a system of values and norms. Money is thereby inserted into a given "symbolic universe" that contributes to its social meaning. It refers to a homogeneous area of social representations characterized by a hierarchy of values and moral norms. A kind of sovereignty is attached to each symbolic universe, and one can consider the area of monetary practices organized around a national currency as a particular symbolic universe whose key feature is a specific and autonomous unit of account.

The qualitative differentiations of money lead us to consider them in principle as different monies whose fungibility is not guaranteed. Analyzing the conditions of interaction between various monies, which may require conversion operations, plays a key role precisely because of the uncertainty over monetary fungibility. The critical element is that money is not considered as a mere quantity (in units of accounts). Yet, qualitative differences help take into account different ways of using money, as well as separate concrete monetary forms. In this renewed framework, understanding how monies are linked requires analysis of the possible binary relations between two given qualities of money. These relations cannot be understood as purely instrumental (i.e., horizontal, between equivalences), since qualitative and hierarchical criteria play a role through the symbolic universe as well as being symbols conveyed by monetary forms.

2.2. Binary relations

Four binary relations between monetary assets will be identified: commensurability, convertibility, co-use and coincidence. After having presented and defined these relations in this paragraph, the next section will show how their

combinations help to provide practical criteria for building means of linking monies. It should be noted that the economic postulate of monetary fungibility stems from the combination of the two first relations: a common valuation of assets, followed by conversion.

2.2.1. Commensurability

Commensurability is the most fundamental criterion to be considered in the analysis of links between types of money. Cumulating means of payment in order to complete a payment requires, first and foremost, these means of payment to be of a common measure as well as debts to be paid with. This commensurability is also a basic requirement of conversions or exchanges from one money to the other. Commensurability may be defined as an ability to obtain a common valuation of them through a given rate². Let us consider a monetary asset A_i held by a person. Quantitatively, A_i is an amount of money defined by a given quantity q_i of the money unit M_i , with $A_i = q_i M_i$. Two money assets A_i and A_j are commensurable if they are equalized by an equivalence rate r so that $r = A_i / A_j = (q_i M_i) / (q_j M_j)$. For example, 100 units (q_i) of the euro are commensurate with 100 units (q_j) of the dollar, with a rate $r = 1.086$ as at 8 April 2015.

While commensurability is at the very basis of any link between different monies, it cannot be viewed as self-evident. Any money asset A_i is indeed also characterized by specific qualities that may prevent any commensurability. An asset A_i is characterized by the monetary form F_i it takes, and the symbolic universe U_i into which it is inserted – not considering here the other two qualities of earmarking and authenticity. These qualitative characteristics, including the general conversion rules prevailing in the symbolic universe under scrutiny or technical constraints, may make it difficult, if not impossible, to compare monetary assets.

For example, the USSR and European centrally-planned economies enforced multiple exchange rates in order to control conversions between the rouble and foreign currencies. Moreover, many cases of dual or multiple exchange rates can be found in the history of the post-gold-standard system. They were opposed by the IMF Articles of Agreement, as article VIII, section 3 prohibits “discriminatory currency practices” such as “multiple currency practices”. At the end of 2013, 16 member countries out of 188 still had a dual or multiple exchange rate structure (IMF, 2014) – there were 42 in 1982. Many of them were implemented to separate current account flows from capital account flows (Fleming, 1971). All these cases produced a fragmentation of commensurability,

² Ordinal comparisons do not strictly require commensurability to be considered; there is consequently no rate to be defined, just hierarchies.

not its impossibility. In other cases, no rate r emerges anyway. In the realm of contemporary CCCs, the most remarkable cases of non-commensurability are provided by time banking (see for example Collom & al. 2012), wherein the rule of hour-valuation for any transaction prevents any regular comparison between exchanged hours within the scheme and national currencies in use. In this case, comparison, and to a greater extent conversion, can only be achieved by contradicting the very principles of the scheme. Many non-Anglo-Saxon LETS schemes, and notably French SELs, rely on a unit of account that hovers between time accounting and the national unit of account, making it impossible to find an easy way of comparing amounts and debts between CCCs and the outside economy. Moreover, besides the formal rules set up in every LETS scheme, actual exchanges may display a great variety of uses in terms of how amounts are fixed, between strict hour-of-time valuations and bilateral negotiations that could possibly refer to market prices (Douthwaite 1996, p. 69-72; Servet ed., 1999, p. 151-173; North, 2007, p. 80-83).

By opposing commensurability, the moral values of the schemes are materialized, building an autonomous symbolic universe within which market exchanges are kept at a distance from these values.

2.2.2. Convertibility

Conversions or exchanges of an asset from one monetary form to another require them to be commensurable. However, this condition is not sufficient. From an anthropological point of view, conversion means the transformation of the monetary asset's characteristics so that some or all of its qualities are transformed: the symbolic universe into which it is inserted and/or the monetary form it takes –with other qualities such as earmarking and authenticity not being taken into consideration.

Foreign exchange, both in economic terms and how it is commonly accepted, consists of a conversion operation based on the symbolic universe U_i and the monetary form F_i ; for instance, the conversion of an amount of yen to dollars. But the withdrawal of cash from a bank account in the same currency is also a conversion operation in the broader sense: it converts the monetary form F_{i1} to another one F_{i2} , with the monetary unit M_i remaining unchanged. A conversion can also be performed by the transition from one symbolic universe to another without a transformation of the monetary form: history provides us with examples of expanding uses of colonial cash by indigenous populations and sometimes, conversely, extended uses of indigenous money by the colonists (e.g. in Africa, see the classic study of Bohannan, 1959; in North America, see Shell, 2013). In the realm of CCCs, mutual credit systems such as time banks and LETS do not allow for any form of convertibility. However, in Canadian LETS,

commensurability is ensured by anchoring the unit of account into the national currency. Thus, whereas conversion requires commensurability, the reverse is not true.

2.2.3. Co-use

When various means of payment are used simultaneously, this can be summed up by the “co-use” relation: for example, adding a £1 coin to a £10 banknote in order to complete a payment results in different monetary forms being used simultaneously, i.e. co-used. In this simplified case of a daily practice, co-use is linked with the commensurability of both means of payment (they are marked with the same unit of account) and their reciprocal convertibility (coins can be changed into banknotes and vice versa).

More generally, however, the co-use binary relation does not require convertibility, as shown by contemporary CCCs. In numerous cases, CCCs display commensurability and co-use with the national currency but not convertibility. For example, Canadian LETS credits can be used to pay for market goods along with the Canadian dollar, which is required by the professional sellers in order to enable them to pay taxes (e.g. see Douthwaite, 1996, p. 64-74). There is however no convertibility between the dollar and LETS credits, their issuing principles being incompatible (Kichiji & Nishibe, 2012).

2.2.4. Coincidence of spheres of uses

A final relation can be identified which is of interest for this discussion: the coincidence of spheres of uses of different monetary assets. The coincidence relation means that various monetary assets can be used in the same socio-economic sphere: for the same set of operations or goods and services, with the same series of partners, by the same set of users, within the same territory, etc. Although its links to the previous binary relations are not as easy to analyse, it can nevertheless be assumed that complete coincidence cannot be achieved without commensurability, convertibility and co-use.

In Polanyi’s conceptual framework, “all-purpose money” would display such a coincidence relation, while the former is contradictory to the “special-purpose money” that characterizes so-called primitive or archaic societies (Polanyi, 1957). However, as with the brass rods studied by Bohannan (1959) in the Tiv society (Central Nigeria), monies can be used in different spheres, enabling connections between them, without being all-purpose money. This generates hierarchies between monies, depending on the way they connect spheres and circulate in a wide range of value-driven spheres. In the realm of CCCs, the spheres of use of local currencies are most generally a subset of that of national currencies, which allow the co-use of these two kinds of currencies. In this case, whether it is possible to pay for goods with a combination of local and national

means of payment is not a matter of discussion. However, by putting the figure of “prosumers” (this gathering of consumer and producer functions in a single person, see e.g. Gómez, 2009) centre stage, LETS, time banks and the Argentine trueque promote the extension of money to exchanges that would not have been monetized or that would not have occurred anyway, such as those related to the Polanyi householding principle of integration (Gregory, 2009; Hillenkamp, 2013). Consequently, they contribute towards building new monetary spheres of use that are partially separated from the usual spheres of use of national currencies.

3. Competition and complementarity unpacked

Combining these four binary relations between monetary assets makes it possible to formalise more complex interactions between monies. Indeed, the empirics of CCCs display various interactions: while local currencies are partially convertible, LETS-like systems and time-banking schemes do not include this possibility. Although time-banking schemes and French SELs establish units of account that are not commensurable with the national one, local currencies fix their unit of account with reference to the national one and most generally at par with it. While time-banking schemes generally exclude co-use of monies, Canadian LETS systems and local currencies make it possible. Although local currencies aim at being used along with the national currency for some of the uses of the latter, many LETS systems and time-banking schemes introduce new uses of money for care relationships and highly personalized if not friendship-based transactions. Hence the seemingly simple notions of competition and complementarity refer to a wider range of possibilities. Unpacking both notions is then a logical necessity. The binary relations introduced above provide a framework that helps to characterise four means of linking monies: substitutability, simultaneity, supplementarity and autonomy. Competition and complementarity can be found at different levels in these means and they do not appear to be strict opposites.

3.1. Substitutability

Focusing on the binary relation of commensurability and convertibility leads us to identify substitutability as an initial means of linking monies, although it requires a more complex combination of binary relations.

Commensurability enables monies to be compared by means of a single rate r . A conversion (or exchange) implies two different rates that depend on the direction of the transaction: a rate r_{ij} from the money M_i to the other M_j , a rate r_{ji} for the reverse. The difference between both rates is a matter of money changing policies that include cost-recovery, profit and general goals. In the realm of contemporary CCCs, direct

conversions are impossible with LETS, time banks and trueque, but they can be made between local and national currencies. Conversions are ruled by the internal policy of the scheme. The difference between r_{ij} (say, inflows of national currency to the local one) and r_{ji} (outflows) is both quantitative and qualitative. From a quantitative viewpoint, the gap is a matter of encouraging inflows (through a discount of 5% to obtain the local currency, as in the BerkShares case, in the U.S.A...) and/or discouraging outflows (e.g. charging 3% of the amount to be changed back into the national currency, as in the Bristol Pound case, in the U.K.). From a qualitative viewpoint, local currency schemes generally prevent any outflows from individuals in order to keep their expenses within the scheme; consequently, they limit conversion possibilities to businesses, shops and other professional members and charge them a fee.

The ability to change or convert one form of money into another, at a rate r_{ij} , that is useable at least partly within the same sphere of use, gives rise to a degree of substitutability that is all the more greater as the spheres coincide. A high degree of substitutability means that currencies are highly interchangeable, regarding their potential uses: either their qualities are identical, or those qualities are treated so as to become irrelevant or meaningful, so that a comparison may be made simply through the quantitative criterion. Money is thus fully fungible, as postulated by mainstream monetary approaches.

The substitutability of two monies puts them in a competitive relationship. Competition can be observed even when substitutability is incomplete – but exists anyway. This is the case in local currencies: whereas monies are convertible at the conditions briefly presented above, the possible uses of such local currencies and a national currency only coincide partially. A series of characteristics make local currencies imperfect substitutes to national currencies. For example, referring to the monetary form F , the face value of the notes often ranges from 1 to 50 units in the Eurozone, a far narrower range than that of the face value of the standard euro coins and banknotes (from 0.01 to 500 units). Moreover, the number of professional members who accept local currencies is very limited (from a dozen to nearly 700, in the cases of the Eurozone) hence only a limited number of goods and services can be accessed with this money. Given the major spatial limitation of the circulation of local currencies, substitutability is asymmetrical: local currencies are far more substitutable with national currencies than the reverse – which is obviously a major threat to the existence and development of the former. Within the limited space of circulation of the local currency, there is still a possibility of competition between both – making the term often used for it “complementary currency” somewhat misleading. That is why, although German Regiogeld are usually presented as “complementary currencies”, the

Bundesbank study into the risk of local competition for the German Regiogeld with the euro made sense, despite the fact that the conclusion reached in 2006 was clearly that the euro did not face any serious risk (Rösl, 2006).

Eventually, the qualities of any particular form of money play a role in the degree of substitutability and, therefore, of competition, with others. As seen above, contemporary local currencies generally prevent outflow conversions by individuals. As a consequence, under-the-counter conversions might develop, but they are generally hindered by the activist background of members in schemes wherein practices are bound by ethics and have a limited scope. The promotion of specific values is synthesized by the definition of a specific unit of account, although generally fixed at par with the national one. Ethics materialise through rules. In French cases, for example, charters formally state the way founders and members should orientate their scheme, generally including statements on localism in addition to social and environmental goals. They might also state their opposition to the present economic, financial and monetary system. The symbolic universe (*U*) that is generated in this way hinders deviations and, consequently, possible substitutions between local and national currencies – as far as this differentiation is implemented in fact and respected by the members of the scheme. As a consequence, the more economic expectations dominate values, the more monies are substitutable. In this respect, and interestingly, Evans (2009) concluded that what he called “local currencies” (referred to herein as CCCs) were in competition with the national ones and could be chased out of most members’ uses when the expected economic benefits were not realised. Evans did not use the term “complementary currencies”, most probably because of its apparent incompatibility with the observed competition. As another consequence, the more success a scheme experiences, the greater the risk of an ethical drift, a weakening of the specific qualities of the local currency, and possibly a rise in the substitutability of the local currency: here is the deadly paradox of local currencies.

To summarize, commensurability and a degree of convertibility and coincidence of spheres of use make monies substitutable. Competition is all the more intense as convertibility becomes easier, spheres of use coincide, monies can be used simultaneously and as qualitative dimensions become negligible.

3.2. Simultaneity

Simultaneity means the ability to use two or more monies simultaneously, i.e. to combine different types of money in order to make a payment. This provides an initial meaning of complementarity. With regards to what constitutes national money nowadays, it is possible to make a payment by combining various coins and banknotes, but a payment can hardly be made using a combination of bank deposits and cash

(corruption may involve such a combination). This major difficulty comes from the nature of the two monetary forms: deposits on the one hand, and circulating paper on the other. Other difficulties may arise from separated spheres of use. While cash can be used for small amounts, large amounts generally require bank payments. That is why simultaneity requires a combination of co-use and coincidence of spheres of use.

However, convertibility and commensurability are not required by simultaneity either. CCCs provide examples of this separation. As already mentioned, LETS systems do not implement convertibility. However, as Canadian LETS include businesses, they have to ensure the commensurability of their money with the national one by fixing its unit of account at par with the national currency, and to accept the simultaneous use of both monies in order to enable businesses to pay their taxes and most of their suppliers. More complex is the case of non-Anglo-Saxon LETS (such as French SELs) and time-based currencies with units of account that prevent a direct comparison with the national one, but wherein, being authorized by the internal rules or only under-the-counter, transactions may involve a part of national currency in order to pay taxes and suppliers. In this latter case, the amount to be paid is separated into two different parts that are not commensurable with each other: one part that refers to the internal rules for determining the values of items transacted in the internal unit of account, and the other part referring to the current system of prices and value in the national currency.

As a consequence, the meaning of simultaneity depends on the presence of commensurability and convertibility. A “quantitative simultaneity”, associated with commensurability and, more importantly, convertibility, allows competition to pervade this complementarity relationship, contrary to a “qualitative simultaneity” in which no commensurability and no convertibility are to be found.

3.3. Supplementarity

What will be called herein “supplementarity” refers to a partial coincidence of the respective spheres of use of different monetary forms within a given monetary system, so that each one provides possibilities that others do not. In this third means of linking monies, complementarity results from the partial coincidence of spheres of use. This is a major feature of any monetary system and, more specifically, any payment system, since there is no single monetary form that covers all monetary uses. Today, monetary systems rely on the supplementarity of a set of monetary forms: coins, banknotes, bank deposits; the diversity of face values of coins and banknotes and the various tools to mobilize bank deposits (cheques, bank cards, direct debits, transfers etc.) allow a wide extent of uses. Moreover, monetary rules organize such supplementarities: in Eurozone countries, coins and banknotes are legal tender up to a certain amount, above which only bank money is legal tender. However, while

supplementarity within national monetary systems is associated with commensurability (through the country's sole unit of account) the reciprocal convertibility of means of payment and their partial co-use, supplementarity does not require these associations. This simple example, in fact, displays a combination of two distinct forms of supplementarity, one being linked to quantity and the other to quality. Their relation to fungibility is therefore different.

From a quantitative viewpoint, supplementarity refers to the fact that adding up distinct monetary forms provides access to other transactions that would not be possible if only one were used. The partial coincidence is therefore linked to co-use possibilities, and supplementarity notably builds on simultaneity. These distinct monetary forms appear to be fungible. Paying for a meal in cash may involve combining notes and coins (co-use), with each type (e.g. in the U.K. a £1 coin and a £20 note) referring to partially distinct spheres of use because of their differentiated face values. This “quantitative supplementarity” can be found in the case of contemporary local currencies, which do not cover the whole spectrum of usual needs for cash and, thus, must frequently be used with the national currency to complete payments³. This requires commensurability and forms of convertibility: consequently, quantitative supplementarity gives way to a degree of competition.

However, differentiation can be qualitative as well, giving place to a rather different meaning of supplementarity. A first understanding of this “qualitative supplementarity” may be provided by coin-operated vending machines, which have been developed since the end of the 19th Century. In their case, supplementarity does not come from the co-use of coins and notes (as in the case of restaurant bills), but from the specific capacity of coins to pay for the drinks and other items distributed by vending machines. The impossibility of using simultaneously means of payment such as cash and deposits is an example of such qualitative supplementarity. The latter does not require any degree of co-use, contrary to quantitative supplementarity. Moreover, fungibility is not necessary as well. As a consequence, qualitative supplementarity may exclude any form of direct competition. Qualitative supplementarity is the crux of Kuroda's works on complementarity (2008a, 2008b). Indeed, he identifies different “layers” or “currency circuits”, where various types of currencies are complementary because they serve different spheres of use, convertibility being difficult and co-use not being systematic. In primitive societies (to take Polanyi's way of thinking), the nature of money as “special purpose” makes it a set of distinctive monetary forms that pay for

³ They mostly take the form of notes which have face values ranging from one unit of account to a maximum value that is lower than the maximum face value of the national banknotes: e.g. notes from £1 to £20 for the Brixton pound in London, from €1 to €50 for the Chiemgauer in Germany.

specific services, rituals and compensations, fungibility not being a requisite. It is almost impossible to find such cases of supplementarity without fungibility in contemporary industrial societies.

Both qualitative and quantitative complementarities may be found in today's CCCs. In contemporary local currencies, the ethics of the schemes introduce morals and quality issues by limiting the sphere of uses to activities that suit the values at the heart of the system (e.g. organic food) while excluding others (e.g. agro-industrial food). They do not, however, constitute a separate sphere of uses: instead, they focus the use of money on a smaller, select network of users and promote a quantitative supplementarity. This is different to other schemes that may aim to encourage new practices by members – e.g. rewarding environmentally-friendly practices like bringing used items to a waste collection centre. The distributed amounts of currency are then useable within a network of approved businesses or local public services (Sambeek and Kampers, 2004). In this case, supplementarity is led by qualitative differences due to extending specific monetary uses to new fields.

The result of all these factors is that the degree of substitutability and of simultaneity within supplementarity, and therefore competition, is as high as the co-use and coincidence of spheres-of-uses are extended: that is to say, supplementarity is a form of complementarity that enables competition when it is quantitative.

3.4. Autonomy

When separate units of account exist with no parity or fixity between them, these units build separate symbolic universes with specific value systems and, consequently, sovereignties. These separations display various forms of monetary autonomy, including the usual cases of national currencies established by sovereign states. Indeed, autonomy refers to the ability to create one's own law. However, autonomy can hardly be absolute; on the contrary, it generally includes a series of dependencies that are hierarchically less important than the principle of autonomy. For example, while sovereign states do have this capacity to create their own law, they are committed to a long series of international agreements and transnational regulations that, in fact, reduce their own capacity to be fully autonomous. Regarding means of linking monies, it is important to highlight the difference between strong autonomy and low autonomy, depending on the capacity to commensurate and convert money. The capacity of autonomy to oppose competition depends on this strength.

The absence of commensurability defines “strong autonomy”: no rate r may help compare one monetary asset A_i with the other A_j . Contemporary time-based money prevents any comparison with national units of account through a direct and stable rate r ; this specific feature makes them highly autonomous and formally non-substitutable,

as well as highly complementary to the national monetary system by providing forms of qualitative supplementarity. This absence of commensurability expresses and reveals value systems that are built to be different: market prices of most transactions in national currencies versus time-based payments that not only oppose market pricing but also classical and Marxist theories of values wherein the value of labour depends on the actual and differentiated contents of any hour of labour. The symbolic universe of time banking is therefore disconnected from the universe of national currencies, and of most monies in general. The difference between monetary qualities can in no way be reduced to quantities: on the contrary, by preventing any comparison, no calculation is made possible. As a consequence, no convertibility is possible at all and fungibility is totally out of consideration.

However, autonomy can also be built within commensurability: this can be called “low autonomy”. National currencies are autonomous but connected to the international monetary system, though to varying degrees. Exchange controls operate this separation, preventing some kinds of monetary inflows or outflows, enforcing the registration of others, submitting them to ceilings or subjecting these flows to other conditions. When there is no separation through exchange controls, the fluctuating exchange rates make it clear that one national currency is simultaneously separate and connected to others. The case of fixed currencies at par and without any controls over flows, however, makes this low autonomy a fantasy, as shown by Mundell’s trilemma, since the connection takes precedence over autonomy: this was the case with Argentina in the early 1990s. Only sovereignty has the ability to take control over money, as it did at the beginning of 2002 when the Currency Board that linked and submitted the peso to the dollar was eventually abandoned. Countries that establish various exchange rates $r_1, r_2 \dots r_n$, depending on goals are far more autonomous, a good example being the USSR up to its collapse: commensurability is indeed fragmented.

Overall, autonomy impedes competition all the more so as convertibility is restrained and commensurability is rendered difficult. Irreducible qualities therefore play a major role in autonomy, especially through the emergence of symbolic universes with incompatible value systems and a clear separation of spheres of use. That is why the dollarization processes which occurred in many developing countries between the 1970s and 1990s reduced their monetary autonomy: the lowering of exchange controls, the actual replacement of the dollar with the national currencies in a series of uses, from storing wealth to making payments, through indexing or direct domestic price fixing with reference to the dollar, led to an increasing pervasion of the dollar in the usual spheres of use of national currencies. The autonomy of national currencies was reduced, as currency substitution soared. Such low levels of autonomy are compatible with forms

of competition that arise through dollarization-like practices and, when prohibited, through black-markets.

4. Two cases of complementarity and competition combined

Identifying such means of linking monies as substitutability, simultaneity, supplementarity and autonomy allow us to analyze the various ways complementarity and competition can operate. This also shows that competition and complementarity are not exact opposites, for they can be combined in a series of cases. In any case, monetary qualities are a stabilizing factor limiting competition between currencies. With regard to the tension between qualities and quantity in general, the so-called CCCs vary between two poles. At one pole, they are founded on specific values that build a proper symbolic universe that is not reducible to the usual money's symbolic universe: qualities prevail over quantity, as can be seen in the case of time-banking schemes and non-Anglo-Saxon LETS systems. At the other pole, no other values than that of the usual money's symbolic universe are emphasized: quantity has the upper hand over qualities. In the first case, competition is greatly hindered because of the money's specific features, which provide the main motivation to use it. In the second case, competition is normal and the main motivation for using money is the personal interest each user can gain from it.

This essential analytical point can be developed through the synthetic examination of two cases related to CCCs wherein so-called complementarity was challenged by competition processes that undermined the systems. First, a case of low autonomy combined with qualitative supplementarity: that of the trueque, wherein competition arose as the network experienced a boom during the general crisis in Argentina. Secondly, a case of simultaneity combined with low autonomy: that of the experimental version of the SOL in France, which never reached a satisfactory level.

4.1. From boom to bust, a value drift: the trueque, 2001-03

It is not the goal of this article to describe the history of the trueque in Argentina or undertake a thorough analysis of it⁴. The purpose of this paragraph is rather to present an analytical viewpoint of the trueque crisis, drawing on the conceptual framework that has been established above. Soon after the creation of the first trueque *nodo* or *club* by ecological and community activists in 1995, the network experienced a significant development. The major Argentine crisis of 2001-02 accelerated the phenomenon and the number of schemes seems to have topped 5,000 with the number

⁴ Instead see Gómez (2009). Others useful works include Hintze (ed.) (2003) and Plasencia and Orzi (eds, 2007).

of members reaching the 2.5 million mark if not more. However, it collapsed even more quickly than it had grown.

With the outbreak of the Argentine crisis in 2001, marked by the *corralito*, a harsh limitation on deposit withdrawals and the use of banking services, the trueque was introduced as a solution to cope with the disastrous effects of the crisis in terms of employment, income and accessibility to money and, therefore, to secure access to goods and services. For a modest membership fee paid in pesos, anyone could gain access to the *nodo* (the local club) of a given network and receive a portfolio of 50 *créditos*. Money was issued at the time of new memberships, and no effective solution to withdraw money was set up (the rule of repaying the received amount of *créditos* when leaving the scheme did not prove to be effective); money supply could therefore only increase. The *crédito* was at par with the peso but inconvertible: a form of low autonomy, providing a qualitative supplementarity to their users, since what could be accessed during the *ferias* (regular market periods) could hardly be found outside. The newcomers' training period of a few hours (the *capacitación*), which was a key to preserving and spreading the rules and values of the scheme, was no more effective because of the massive inflow of new members. The franchising policy that was implemented by the main network (RGT) helped spread the trueque very quickly throughout the country but lowered the values required of members. Direct competition was formally hindered by the rule of non-convertibility. However, as values dropped along with the boom of the trueque, two forms of indirect competition developed that eventually proved to the disadvantage of the *crédito*.

Firstly, as a very common deviation in market exchange matters, the prohibition (or formal impossibility) of conversions proved ineffective since individual demands developed: buying *créditos* in order to access to goods at *ferias*; selling *créditos* to get rid of them when *ferias* proved to be less interesting than before. Under-the counter conversions opposed the rules of the schemes but, more seriously, buying *créditos* with pesos opposed one of the core values of the trueque, *i.e.* the promotion of prosumers (*prosumidores*), *i.e.* the principle according to which members should be simultaneously consumers and producers for the dynamic evolution of the trueque scheme (with the initial allocation of *créditos* not being renewed, members should sell products to obtain more *créditos* and continue consuming).

Secondly, the goods sold on the marketplaces were mostly second-hand, handmade goods (such as food) and services, or items that had been purchased in pesos somewhere else, especially in supermarkets. The latter case developed as the peso became scarcer during the time of the *corralito* and as basic needs included, notably, oil and flour that could hardly be produced by private individuals. This simple fact means

that comparison (led by the commensurability between the *crédito* and the peso) generated individual actions that could take the form either of arbitrages (operating on the basis of differences in prices to get a profit without risk) or even of speculation (taking a risk on prices to make a profit, which would have needed under-the-counter conversions). This situation eventually proved to be at the *crédito*'s disadvantage, because of two factors. Firstly, during the time of its boom, the *crédito* was chosen by default, not for the values it bore; when the situation grew better, and especially when the *corralito* was lessened, the massive newcomers preferred to go back to the peso because it was in their interest. Secondly, the *crédito* was over-issued and counterfeited, and this led to a massive rise in the prices of goods sold in *créditos* and to a massive fall in its value expressed in pesos.

To summarize, even in cases where direct conversions are not allowed by the rules, a form of competition can be generated by under-the-counter and indirect conversions. When direct conversions develop, money changers emerge as specialist intermediaries who prompt competition between currencies, be these conversions authorized or not. Regarding indirect conversions, they refer to the ability to convert the monies M_i and M_j into a third term T , be it another form of money or goods. In this case, the calculus of bilateral rates ($r_{iT} = (q_i \cdot M_i) / (q_T \cdot T)$ and $r_{jT} = (q_j \cdot M_j) / (q_T \cdot T)$) make it possible to calculate an indirect rate between both monies ($r_{ij} = (q_i \cdot M_i) / (q_j \cdot M_j)$) and compare their relative purchasing power. These comparisons may generate arbitrage and speculation and, then, competition between monies. The case of the trueque in Argentina around 2002 shows such processes; the value drift weakened the specific features of the trueque's symbolic universe and helped destroy the trueque by allowing people to act according to their immediate individual interest only. Such movement towards competition is compatible with Evans' analysis of local currencies (Evans, 2009).

4.2. Hidden stagnation: the experimental SOL, 2007-12

As for the trueque, no history of the French SOL project is to be found here, nor an in-depth analysis⁵. This section focuses on the experimental phase of the SOL project that began to be rolled out in 2007.

The SOL was first tested in 2005 through an awareness campaign and launched as an experiment the following year through the European programme EQUAL, which bore half of its costs up to 2009. Ethics were central to the project: the explicit purpose

⁵ Very few academic works exist on this case. See mostly Fare (2011, 2012). Hibon (2012) is an informative work from the inside.

of the project was to promote a societal project based on ethical, environmental and social values.

As the project was implemented from 2007 onwards, it mostly focused on a loyalty scheme within a network of approved professional members. Supported by a large subsidy from the EQUAL programme and led by four major organizations in the social economy, major technical decisions were taken: money was to be used through chip cards that required professional members to be equipped with costly terminals. There were two means of issuing money: joining the *association* (not-for-profit organisation), new members received a chip card credited with a certain amount of “SOL points”; then, paying in euros for services and goods at local shops, associations etc. provided discounts by crediting SOL points to the chip card, as a percentage of the member’s expense. Unlike local currency schemes, no inflows by converting the national currency into the complementary one were possible. SOL points were commensurable with the euro at the fixed parity of 10 points per euro; they were backed by an equivalent reserve in euros; however, they were not convertible for individual members, only for professional members. Members could pay for a part of their expenditure in SOL points in approved shops. SOL points were therefore in a quantitative-simultaneity relationship with the euro (because they could be used along with the euro for common goods and services), combined with a degree of low autonomy thanks to a controlled convertibility and the value system at its core.

In Grenoble, the most dynamic of the seven locations where the experiment took place, 1,360 chip cards were distributed between November 2007 and the end of 2012. Nearly half of these cards were distributed before the end of 2008. Many were never used by their holders. The ratio of card users to card holders declined gradually from 2008, from nearly 50% in 2008 to 10% in 2011 (Hibon, 2012). An even more dramatic change was observed regarding the active professional members. The number of approved professional members stagnated from 2009 onwards and the ratio of active members fell from 76% in 2009 (19) to 28% in 2011 (only 7). Eventually, the free distribution of already-credited chip cards failed to keep their holders in the scheme, which in any case appeared unattractive because of the very limited number of professional members.

It is not possible to develop a full analysis of this failure in just a few lines. With regard to the issue of means of linking monies that constitutes the subject of this paper, one can at least emphasize the following points. Firstly, whereas the SOL combined quantitative simultaneity and low autonomy, the former was clearly the most important. Simultaneity was as important because payments could hardly be made with points only, if at all. This means that the euro was always required. At this stage, the scheme

was a mere adaptation of loyalty schemes for an ethical network of shops and other professional members. The values at the very heart of the project did not prove to be a deciding factor in using money, notably because of the free distribution of chip cards to people who would not have used the scheme if they had had to make an effort to gain access to it. In fact, many of them did not actually use the credit they had received. The choice between personal interest and the scheme's values clearly lay closer to the former, and the scheme did not succeed in moving people towards the latter. The SOL was stuck in competition with the euro.

A time-based scheme of rewards given to volunteers was also planned but not implemented. If it had been, it would have changed the overall meaning of the experiment, by extending the sphere of use of the money to areas where no money is used at all usually (because of volunteering). This would have given place to qualitative supplementarity rather than just quantitative simultaneity, giving the ethical aspect of the project a stronger role and strengthening the complementarity that was the SOL's motto, against the inhibiting competition with the euro. However, the connection between a time-based monetary unit to the euro-based loyalty scheme appeared to be a hurdle that could not be overcome: issuing principles appeared to be incompatible and convertibility from time to euro was considered impossible.

5. Conclusions

Table 1 summarizes this research with regards to the concepts and cases that have been discussed. As stated by theories supporting complementary currencies, competition is not the only way monies can be linked. But complementarity is not the opposite of competition. Drawing upon four binary relations (commensurability, convertibility, co-use and coincidence of spheres of use), this paper has developed four means of linking monies (substitutability, simultaneity, supplementarity, autonomy) that display various links to competition and complementarity, and both can be found together in some cases. Consequently, competition pervades many cases of complementarity, and forms of complementarity can be found in situations of competing monies. Eventually, the qualitative dimensions of money, mostly made up of values, constitute a stabilizing factor that limits competition. The empirics of contemporary, so-called community and complementary currencies display various links that help to understand this complexity: it constitutes a field of observation that contributes to the critical examination of both orthodox and heterodox economist approaches to money.

Table 1 – Summary of means of linking money

| Means of linking money | Main binary relations under scrutiny | Sub-categories | Place of competition and complementarity | Cases |
|-------------------------|---|--|--|---|
| Substitutability | Commensurability and, secondarily, convertibility | / | Competition first, which is all the more effective if there is convertibility, coincidence and co-use. | Pervades cases of the <i>trueque</i> and of the experimental SOL |
| Simultaneity | Co-use and a degree of coincidence of spheres of use. | <i>Qualitative</i> if only co-use and coincidence. | Complementarity first | Canadian LETS |
| | | <i>Quantitative</i> if also commensurability and convertibility | Commensurability and convertibility introduce competition in complementarity | Central feature of the experimental SOL |
| Supplementarity | Partial (or no) coincidence of spheres of use. | <i>Qualitative</i> when no co-use ; | Complementarity first. | <i>Trueque</i> |
| | | <i>Quantitative</i> when co-use | Co-use introduces competition in complementarity | Local currencies |
| Autonomy | Convertibility and, secondarily, commensurability. | <i>Strong autonomy</i> when no commensurability | Complementarity first. | Time banking |
| | | <i>Low autonomy</i> when commensurability, and possibly limited convertibility | Commensurability and convertibility introduce competition in complementarity | National currencies in the international monetary system. The <i>Trueque</i> and experimental SOL |

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