IJCCR

www.ijccr.org · ISSN: 1325-9547

Nishibe, M. (2012). Community Currencies as Integrative Communication Media for Evolutionist Institutional Design. *International Journal of Community Currency Research 16*(D), 36-48. https://doi.org/10.15133/j.ijccr.2012.010

International Journal of Community Currency Research

Volume 16 (2012) Section D 36-48

COMMUNITY CURRENCIES AS INTEGRATIVE COMMUNICATION MEDIA FOR EVOLUTIONIST INSTITUTIONAL DESIGN

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ABSTRACT

The present article shows that community currencies (CCs) are interpreted as integrative communication media with dual aspects of money and language, and that, since money is the most indispensable medium of the modern capitalistic market economy, CCs should be strategic targets for evolutionist institutional design in order to solve current social and economic problems caused by global capitalism.

In order to theoretically view the bidirectional effects caused by alteration of money as a platform institution in its evolutionary perspective, we introduce some basic concepts such as replicators and interactors and illustrate the micro-meso-macro loop model by using those concepts. Then we elucidate the significance and possibility of evolutionist institutional design in policy applications of the theoretical ideas put forward. Lastly, we investigate why and how CCs can be strategic platform media in evolutionist institutional design.

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To cite this article: Nishibe, M. (2012) 'Community Currencies as Integrative Communication Media for Evolutionist Institutional Design' *International Journal of Community Currency Research* 16 (D) 36-48 <www.ijccr.net> ISSN 1325-9547

1. INTRODUCTION

The purpose of this article is to show that community currencies (CCs) which have been used worldwide since the 1990s can be interpreted as integrative communication media, and that, since money is the most indispensable medium of the modern capitalistic market economy, CCs should be strategic targets for evolutionist institutional design in order to solve current social and economic problems caused by global capitalism[1]. We will also show that the case for CCs exemplifies the possibility and feasibility of evolutionist institutional design in contrast to other approaches such as constructivist and operationalist institutional design.

Firstly, we explicate communication media and situate money and language as such, and then show that we can comprehend CCs as integrative communication media with dual aspects of money and language. Secondly, in order to theoretically view the bidirectional effects caused by alteration of money as a platform institution in its evolutionary perspective, we introduce some basic concepts such as replicators and interactors and illustrate the micro-meso-macro loop model by using those concepts. Thirdly, we elucidate the significance and possibility of evolutionist institutional design in policy applications of the theoretical ideas put forward. Lastly, we investigate why and how CCs can be strategic platform media in evolutionist institutional design.

2 MONEY AND LANGUAGE AS COMMUNICATION MEDIA

2.1 Society as an autopoietic or self-producing system of communication

In order to redefine the characteristics of CCs as integrative communication media in the next section, we, first of all, refer to N. Luhmann's ideas and classifications of 'communication media' (Luhmann 1984=1995, 1988).

Luhmann defines a total system of society as an autopoietic or self-reproducing system of communication where "communication creates communication." In other words, society is a closed self-referential communication system (Luhmann 1984=1995 ch.4). Then he regards economy, politics, science, education, religion and the like as partial systems of society in which each of the different symbolically generalized communication media functions independently. Here, communication is conceived not as transferring information from a sender to a receiver but as emergent integrity of three selections of information, transmission and understanding (Luhmann 1988, Kap.2).

2.2 Three kinds of communication media: language, extended media and symbolically generalized media

We must note that the word 'media' has a wider connotation than is conventionally used for mass media, means of transmission and mediators. Communication media are emergent entities in evolution that can transform uncertainty into certainty of communication and are classified into three types: 1) 'language' that enables communication of meanings by using auditory and visual signs, 2) 'extended media' such as documents, printing and communication technologies that extend the reach of communication by language, and 3) 'symbolically generalized media' such as money, truth, power, love and norms. Each of these communication media concerns uncertainty in terms of 1) understanding, 2) reach and 3) attainment (acceptance), respectively (Luhmann 1984=1995, ch.4.7-8, 1988, Kap.7).

Human agents can obtain more information through such extended media, (i.e., 'reach media') and judge whether they will accept the information based on such symbolically generalized media (i.e., 'reception media'). In that sense, the reception media functions as filters for selecting information and forming motivations. Reception media thus enable both a sender and a receiver of information to share knowledge as a system of information, but the received knowledge is not exactly the same for them. Then, both intersubjectivity (attachment) and subjectivity (detachment) are simultaneously at work and agents are loosely connected.

If certain symbolically generalized media express a large number of things and bring about generalization of meanings, 'symbolic generalization' results in mediating various differences and closing separations. On the other hand, if such generalization of meanings instead creates various differences and mutual separations, 'diabolic generalization' sets in. Normally, these two functions are tightly interwoven.

2.3 Money for a uniform medium bringing about capital and its diabolic generalization

We further investigate the difference between money and language on the basis of Luhmann's ideas that we have just seen. Money and language are 'artificial media' that are the products of social and cultural evolution and are isomorphic in 'generalization' of differences in time, events and societies. The decisive difference between money and language is that, whereas money is a 'uniform medium' that condenses qualitative diversity and complexity of commodities into one-dimensional information as prices, language is a 'diverse medium' that enables far richer expressions that maintain variety and complexity[2].

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1 The present article aims at integrating the basic ideas in a series of the previous articles (Nishibe 2002, 2004, 2005, 2006a, 2006b, 2010) and showing a synthetic view of CCs for evolutionist institutional design.

2 It is interesting to see that, from a rather different viewpoint with the present paper, Hart (2000) describes the similarity between language and money as two different memory banks and suggests that both would converge in the age of Internet and CCs.

The form of payment by money involves much simpler structures than does the form of statement by language. Money as a measure of value reduces complexity in the real world to a one-dimensional value, and the form of payment functions as a symbolically generalized medium so that division of labor and knowledge as well as new discoveries and innovations are encouraged and sales of a great amount and variety of merchandise in the market are facilitated.

Money, at the same time, brings about the diabolic generalization that expressing everything in uniform prices destroys characteristic properties and qualitative diversity in terms of culture, value and norms particular to nations, local communities and groups of individuals. This problem has become more serious, as more individuals have come to use money as 'capital' for only the purposes of value augmentation and accumulation. Practices of investment and speculation have spread, and thinking ways in terms of rational choice of alternative such as opportunity cost and human capital have prevailed in recent years. This means that the consciousness of people gradually approaches that of capitalists. Women and mothers have gradually come to regard domestic labor and childcare as lost opportunity to earn wages in the workforce. Younger people at present tend to conceive of not only various qualifications but also higher education and learning as investment in their own human capital for gaining higher future income. Such changes in value and consciousness accelerate the dissolution of communities such as universities and families into markets. Later, we will examine what solution CCs as integrative communication media offer to the aforementioned problems.

3. CCS AS INTEGRATIVE COMMUNICATION MEDIA

3.1 CCs with both aspects of money and language

Let us now take a look at how we can describe CCs in view of communication media such as language and money as discussed above. First of all, we must pay attention to the unique characteristics of CCs in this respect.

CCs certainly have aspects of both 'money' and 'language,' like Janus the god in ancient Roman mythology who has two faces looking forward and backward. Although CCs actually are syntheses of these two factors, they tend to have stronger economic connotations because of the association between the words 'money' and 'currency.' In order to clarify that CCs stretch over not only economic domains but also social and cultural domains, we name them 'integrative communication media' since they are endowed with the characteristics of both 'economic media' as money and 'social and cultural media' as language.

Luhmann thinks of the whole society as an autopoietic system of communication and divides it into several subsystems according to 'symbolically generalized media' such as money, truth, power and others. We also regard CCs as belonging to the same category, but consider them unique in the following senses. They possess the main purpose of vitalizing both local economy and local community, and express and convey the values, interests and ethics shared by members of a community, different from conventional money that specializes in economic functions, and thus CCs are not merely language and extended media but also symbolically generalized communication media such as love and norms. Accordingly, CCs are found to have all properties of three kinds of communication media. What CCs accomplish is not to differentiate the whole society into subsystems as do conventional symbolically generalized media such as money, power, truth and love, but rather to integrate such divided social subsystems.

Luhmann explains that a whole society is a closed self-referential communication system whose subsystems are operationally close with different symbolically generalized communication media functioning independently. If so, how can the integration of subsystems by CCs actually take place? Here we have to focus on the peculiarity of powerfulness of money compared to other symbolically generalized media. Since money is a 'uniform medium,' it can successfully reduce our complex and large-scale society as a whole into decentralized networks as cash nexus composed by autonomous transactions as buying and selling by using one-dimensional information as price. All other 'diverse media' cannot do the same. It means that Market with money, neither State with power nor Community with love (fraternity and reciprocity), can solely have the potential to integrate the whole society into the single global market society, as will be shown in section 3.4. This character of money manifests itself as globalization in which money tends to exclude other symbolically generalized communication media.

If we can inhibit such immense propagation of money and weaken its power of social integration, it would be practicable to utilize such ability to connect Market to other social subsystems as Politics and Cultures. In short, CCs can become the communication media for integration, not for division, of the whole society. For this reason, we have described it with the adjective 'integrative.'

3.2 CCs as economic media and social and cultural media

Table 1 shows the dual properties of CCs as integrative communication media (2006b)[3]. First, let us look at the economic aspects on the left-hand side of the table. The monetary aspect indicates the ability of CCs to one-dimensionally express and evaluate a diverse array of heterogeneous goods and services as a magnitude on a single scale, say, 'green dollars.' Sellers set prices of goods and services and wait for buyers to come, and buyers observe

3 Table 1 is presented here for clear conceptualization of CCs' dual aspects abstracted from various properties of actual CCs, not for taxonomic classification of all kinds of CCs currently operated worldwide. For the latter purpose, Blanc (2011, p.7) successfully classifies CCs into Local, Community and Economic from the viewpoint of three kinds of projects as Territorial, Community and Complementary, respectively.

the prices and decide to make purchases if the goods and services are desired and appropriately priced. Such unit transactions of buying and selling constitute 'dispersive markets' conceived as networks of consecutive transactions mediated by money as the means of circulation.

CCs naturally involve such one-dimensional expressions and evaluations and, if they are used repeatedly, circulate among participants as long as goods and services are priced in terms of CCs. Then, we can see that CCs as economic media create some sorts of markets, even if they are different from those in capitalistic market economies. What conventional moneys and CCs have in common is that both of them are uniform media and create 'dispersive markets' such as networks of transactions. A common notion is that CCs create communities not markets, but it is not true.

Aspect	Money (economic media)	Language (social & cultural media)
Purposes	Vitalization of local economy (Autonomy, circulation, recycling)	Rehabilitation of community (Dialogue, interchange, commitment)
Functions	Independent design, issuing and administration Bounded sphere circulation No interest or minus interest	Ferment of trust and reciprocity Cooperative 'prosumers' Linguistic expression and transmission
Forms	Complementary currencies and Emergency currencies (Stamp scrip, LETS)	Mutual-help coupons (Time Dollars, Eco-money)
Domain	Market	Community

Table 1 Dual properties of CC as integrative communication media[4] (Source: Nishibe (2006b))

So what is the difference between conventional moneys and CCs? CCs aim at exchange with reciprocity, that is, 'reciprocal exchange,' and are supposed to form 'coopetitive' (i.e., competitive and cooperative) local markets in consideration of another aspect of social and cultural media. In order to understand that markets can include altruistic and bounded-rational agents and cooperative relations among such agents, it is necessary to widen the conventional vision of the market, which is depicted in neoclassical economics as being composed of selfish and super-rational agents with perfectly competitive relations among them.

Let us now turn our attention to a 'social and cultural aspect' written on the right-hand side of Table 1. This can also be called a 'linguistic side.' All human relations utilize languages and numbers complementarily. Money quantitatively expresses and evaluates everything in prices, so it belongs to 'one-dimensional media' different from 'multi-dimensional media' that language represents. CCs express and convey a diversity of social values, norms and cultures particular to the issuing and administrative bodies and local communities where the CCs are circulated.

3.3 The purposes of CCs

CCs have the purposes, functions, forms and spheres according to these two aspects. The purpose of CCs as economic media is 'to vitalize local economy.' One of the causes for depression and unemployment in local communities is said to be the problem that money flows out of local communities and eventually there is a shortage of money in circulation. For example, Japan has experienced two 'lost decades' of several severe recessions since the collapse of the Japanese asset price bubble starting in 1990. Even though Japan as a whole suffered from recessions, there was a great disparity between metropolitan areas and other regions in term of the rate of bankruptcies and the rate of unemployment depending on the interregional balance of payments and the industrial structure. On the whole, rural areas were much more severely affected.

Most towns and villages have the problem of declining shopping streets in addition to the problems of depopulation and population aging caused by the falling birthrate and migration of young people to urban areas where they find more job opportunities. Although motorization facilitated rural and small-town residents going shopping in supermarkets or shopping malls in larger towns, it also gave rise to 'shopping refugees,' the elderly who do not drive cars and cannot go shopping far from home. When local shopping streets disappear, so do many invisible community functions that they serve, such as street cleaning, mutual aid, childcare and festivals. As a result, the decline of local economies accelerated and the living environments of all residents deteriorated as well. If the people under such circumstances can create their own local money that stay in the community and circulates there, local economies could become more active and relatively

4 All CCs have both properties of economic media and social and cultural media, but the proportions of these are different. For example, time dollars and eco-money are exclusively used for mutual aids and volunteer work, so they are 100% of social and cultural media. On the other hand, Stamp scrips in 1930s are mostly used for shopping daily merchandises in local shops, so it is 100% of economic media. LETS is used for local shopping, but the participants in LETS also exchange their white elephant, skill and knowledge. So LETS is thought of as half and half media. But there is no place in the middle in Table 1, so we put LETS in the left hand side.

independent of the influence of national and global economies. This would encourage forming a sustainable and recycling-oriented local economies of 'local production for local consumption,' which is the ultimate aim of CCs introduced as 'economic media.'

Another purpose of CCs is to 'activate community' or 'activate communication and intercourse.' This corresponds to the 'social and cultural media' aspect of CCs. In order to deeply investigate CC as 'social and cultural media,' we have to take a roundabout way to fully understanding the socioeconomic coordinating principles including markets and the meaning of globalization.

3.4 Globalization: the historical tendency for Market to expand and for Community and State to shrink

In modern capitalistic market economies, all conceivable things including internal organs, genetic material, genetic information, personal information and the right to emit carbon dioxide has been commodified and the market domain has increasingly expanded and deepened.

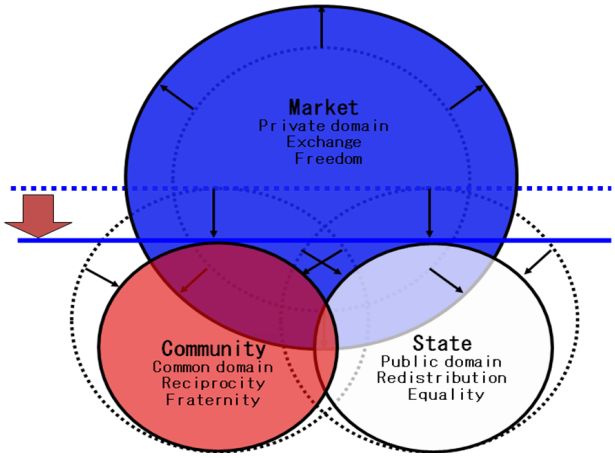

Fig. 1 Globalization (Source: Nishibe (2006a))

Here, in order to make clear the meaning of so-called 'globalization' since the 1990s, we introduce three different coordinating principles of socioeconomics, according to Polanyi (1944) and with some modifications: 1) Market (the private domain of exchange and freedom), 2) Community (the common domain of reciprocity and fraternity) and 3) State (the public domain of redistribution and equality). Let us confirm that three economic principles—exchange, reciprocity and redistribution—exactly correspond to the three political ideals of the French Republic, which originated from the French Revolution—freedom (blue), fraternity (red) and equality (white).

Then, globalization can be interpreted as the historical trend over several decades for Market to expand, and for Community and State to shrink, qualitatively and quantitatively, as shown in Fig. 1. As Marx (1859=1970, 50, 208, 1867=1887, 60) repetitively put it, Market emerges from between two communities, two states, or a community and a state. Once Market emerges from such boundaries, it expands and penetrates into Community and State, dissolves them, and reorganizes them according to Market principles. This tendency can be called 'internalization' of Market. We now understand that globalization is a manifestation of the 'internalization' tendency of Market to commodify everything.

3.5 Capital: the replicator of capitalism to drive globalization as free investment

It is clear that the tendency of globalization is driven by 'Capital'. It is not a tangible thing as inventory, machine, factory, land, but an intangible matter. From the perspective of evolutionary thinking that we will see in section 4.2, Capital is the way to use money for its propagation, that is, the replicator (the institution as a bundle of regulative rules) of capitalistic market economies, not the replicator of a human agent or a profit organization such as a firm. So, to be precise, Capital is the derivative of Market as networks of buying and selling transactions, and it dissolves Community and State and replaces them into Market by its gradual transformation of more kinds of nontradable goods and services into 'fictitious' commodities. If globalization proceeds to its logical end, not only money and assets such as stocks and real estates but also choices, rights, information and genes of ourselves will all theoretically be capitalized as profit-earning opportunities.

If the 'fiction' is realized without any restrictions or regulations in the market, the 'free investment' principle beyond 'free trade' will be fulfilled as the ultimate stage of a capitalistic market economy. We claim that the tendency of globalization actually exists because it is observable that all human relations tend to be reduced to only economic and contractual relations such as buyer-seller and creditor-debtor relations so that all types of communities supported by reciprocal exchange and mutual aid would decline and even collapse. The tendency of globalization has been and is counteracted by 'self-protection of society' (Polanyi, ibid.) as in communism and anti-globalization movements.

3.6 CCs: the countervailing measures for market fundamentalism and creating 'Market within Community'

In order to countervail the tendency of market fundamentalism in daily life, CCs can be introduced to rehabilitate reciprocal communities and revitalize human communications. In Japan, 'Eco-money,' which is a CC designed specifically as 'social and cultural media,' became widely used until the early 2000's. But subsequently more attention has been paid to the use of CCs as 'economic media' since Eco-money was found difficult to circulate smoothly, owing to the lack commercial transaction networks. We must understand from the experience that the uniqueness of CCs lies in simultaneous and complementary coexistence of both the 'economic media' and 'social and cultural media' aspects.

CCs are integrative communication media with aspects of both economic media and social and cultural media. They can associate Market with exchange and competition and Community with reciprocity and cooperation, and integrate Market and Community into 'Market within Community.' Since CCs have a strong affinity for both Market and Community—like soap that allows oil and water to mix—, CCs would work as interfacial active agents at the interface between Market and Community so that the two easily mix. CCs can thus provide a socioeconomic policymaking measure for balancing Market and Community in order to overcome the defects of both: capital running out of control as well as corruption of closed and collusive relations, and 're-embed' the 'disembedded' market economies into society and culture.

3.7 The functions of CCs

Next, let us turn to the functions of CCs. First, we shall examine their functions as 'economic media.'

a) Independent design, issue and management

Any groups can independently and voluntarily design, issue and manage CCs. If people create their own CCs and conduct transactions with them within a certain area, it means that they partially restore the right to issue money as a civil liberty and social right. This is the liberal and democratic property of CCs.

b) Circulation in a bounded sphere

If consumers go shopping at a large supermarket or convenience store, even those within a local community, the money paid flows out of the local community and concentrates at the company's headquarters.

The local money put into savings and investment funds is transferred to a more profitable place, say, a metropolitan area where land rapidly appreciates. Such spillover of money has a negative impact on local economies, especially during a period of depression. CCs are designed to circulate within a certain local area without flowing out of it in order to promote internal transactions of goods and services and eliminate the shortage of effective demand caused by money hoarding. Increased circulation within a community induces local production for local consumption and regionalism.

c) No interest or negative interest

What does no interest on CCs mean? If you borrow money from a commercial bank, you have to repay the loan plus interest. But if you borrow money from your parents or friends, you pay no interest because you have their trust and affection. If you dare to pay interest, it might harm close relationships. Whether people lend money at interest indicates social distance between creditors and debtors. 'Negative interest' corresponds to the cost of holding money known as 'demurrage' and encourages the use, rather than the holding, of money to promote consumption. This idea was embodied in Stamp Scrips according to Silvio Gesell's design. A famous American economist, Irving Fisher, introduced Stamp Scrips to the United States, and consequently the idea of demurrage spread during the interwar period. This is the noncapitalistic aspect of CCs.

These three aspects are the functional characteristics in view of economic aspect of CCs. When we focus on the social and cultural aspect of CCs, the view that CCs are tools for overcoming hardships in a severe depression and economic crisis are too narrow. In Japan, recent examples such as Fureai Kippu (Caring Relationship Tickets) and Ecomoney assigns greater importance to CCs' linguistic aspect, which we will consider next.

d) Trust and cooperation

CCs circulate based on trust and cooperation among participants. Participants interact with each other through transactions, strengthen links of mutual aid and deepen their mutual trust. This is the community forming aspect of CCs.

Let us take the Local Exchange Trading System (LETS) as a representative example of an account-type CC, where the interest rate is zero and the summation of each participant's account balance is the net of credits and debits. In this system, the total debits and credits should sum to zero at any time. We can interpret the situation as follows: a participant borrows money from the community when the account balance is in the red, and lends money to the community when the balance is in the black; they call it square in the community. This zero-sum principle simply expresses the continuous accomplishment of mutual aid and solidarity among participants in the community and provides an institutional basis for deepening trust and cooperation.

e) Cooperative prosumers

'Prosumer' is a portmanteau combining 'producer' and 'consumer.' The term was coined by Alvin Toffler (1980) and characterizes the tendency of economic lives to become more self-sufficient or do-it-yourself in the third wave, the modern information age. 'Cooperative prosumers' are simultaneously producers and consumers and maintain cooperative relationships to mutually help each other and thereby effectively utilize the resources they own. This expresses the ideal of CCs that all participants should stand on equal footing as much as possible by eliminating asymmetry between consumers as money owners and producers as money seekers.

f) Linguistic expression and transmission

Each local community has intrinsic and individual characteristics in culture and nature. Such qualitative differences and diversity cannot be measured in a one-dimensional quantity of money. CCs are introduced and used as social and cultural media to express and transmit such individuality of local communities. There are many unique names of CCs to succinctly express such distinctive traits as specialty, dialect, geography, tradition, mythology and ideal of local

community. CCs thus function as linguistic media regarding local culture, interests and values.

3.8 The significance of CCs as the replicators for new species in socioeconomic evolution

CCs always have aspects of both economic media and social and cultural media, and such duality and complementarity of CCs is the most indispensible property that we cannot find in any other communication medium. So we cannot truly understand the significance of CCs by viewing them from only one aspect or the other. However, CCs usually differ in which aspect is stronger or more embodied in them. CCs further differ in purpose and locality. Whereas CCs evolved as new species from money and language, a diverse array of CC subspecies emerged. The micro behaviors and motivations of participants and the macro performance and patterns of communities composed of participants interact and change each other as time goes on. Such endogenously dynamic changes are considered to be path-dependent and nonrepetitive.

If macro environments are kept constant, or change exogenously and independently of the behavior of micro agents, it is possible to define the 'adaptability' of each micro agent under a given environment. Then the concept of 'survival of the fittest' can also be clearly defined in the sense that individual organisms with maximum adaptability can propagate most successfully. However, we cannot have a meaningful definition of the concept of adaptability if we deal with an evolutionary process where macro environments and micro agents mutually interact and their properties endogenously change. And we must remember that actual socioeconomies are certainly such evolutionary process with endogenous change and path dependence. Consequently, we cannot ask which institution of CC is the best or the most effective because such a question is meaningless in the evolutionary process.

3.9 How can we evaluate CCs for evolutionary perspectives?

Then how can we evaluate CCs from the viewpoint of evolution? Under the present macro environments of capitalistic market economies, CCs are incredibly weaker in terms of survival and propagation than existing national currencies such as the U.S. dollar and Japanese yen, and thus CCs cannot spread or even continue to exist. Even under the unfavorable conditions for CCs, there must be critical situations such as acute financial crises, chronic economic recessions and devastating natural disasters where CCs can transform their weaknesses into strengths. Clearly, CCs must, at the least, become safety nets and complementary institutions utilized as emergency measures in such exceptional situations. But they are only temporary, not constant.

The aim of CCs is to control the negative effects of money as capital (Luhmann's diabolic generalization) and restore the stability and sustainability of socioeconomic livelihood by intentionally restraining money's universal validity with respect to space-time circulation, transaction objects and participants. Is such an ideal of CCs only a beautiful fantasy or a real possibility?

As we have already seen, the powers of survival and diffusion of CCs change depending on the situation. Their weaknesses can be transformed into strengths in a different situation. If so, how can a situation become different? As we have also explained, in an evolutionary process where macro environments and micro agents interact, they would change themselves endogenously. Social reality is found only in such evolutionary processes.

3.10 CCs act as a catalyst on the meso level to help a new micro-meso-macro loop set in

If CCs could somehow survive without being weeded out in such evolutionary environments, they would be able to gradually affect the interests, values, norms, ethics and routines that determine the behavior of participants as micro agents. The influences are initially very small and grow gradually, but once the accumulated effects exceed a certain threshold, some positive feedback mechanism sets in and everything might rapidly change. If CCs could thus act as a catalyst on the meso-level and help a new micro-meso-macro loop to be self-organized, then macro environments change micro agents and micro agents change macro environments and the dual directed interactions drastically and cumulatively change both environments and agents.

Metaphorically speaking, therefore, CCs are similar to slow-acting Eastern medicine for improving overall wellness (e.g., acupuncture), rather than fast-acting Western medicine for symptomatic treatment (e.g., medication). Continuing the metaphor, CCs, by inserting microscopic exogenous material into the immune system or the nervous system of the human body, produce subtle changes in the phases between order and chaos at the region boundary of a system and, consequently, activate each cell in order to vitalize the body system as a whole. We will explain this point more analytically from the viewpoint of evolutionist institutional design in the next section.

4. EVOLUTIONIST INSTITUTIONAL DESIGN

4.1 The Difference between Evolutionist Institutional Design and Other Ideas of Designs

We proposed evolutionist institutional design (EID) as an applied policy method in evolutionary economics a decade ago (Nishibe 2002, 2004). It is a different approach from conventional economics and focuses on evolution of social institutions. EID tries to show an original and effective answer to the difficult modern problems for which conventional approaches cannot easily find suitable solutions.

As Keynesian macroeconomic control policy lost its effectiveness in the 1970s and the communist bloc comprising Eastern Europe and the Soviet Union collapsed in the 1990s, overconfidence in human reason was defeated. Hayek's criticism of 'the fatal conceit' (Hayek, 1988) that

targeted at constructivism and scientism had dominant influences since then. After Hayek, on the one hand, too much emphasis had been placed on fallibilism of rationality, and, on the other, libertarianism had been widely trumpeted. As a result, design came to be viewed negatively until the end of 20th century.

However, biological phylogenetic evolution that generated human beings as social animals involves emergence of such artifacts as tools and machines that are designed by humans. Although the concept 'design' in itself might imply artificial planning and construction, it is fairly possible to introduce a new way of 'design' in order to implement socioeconomic policies based on the natural, complex and nondeterministic properties of evolution.

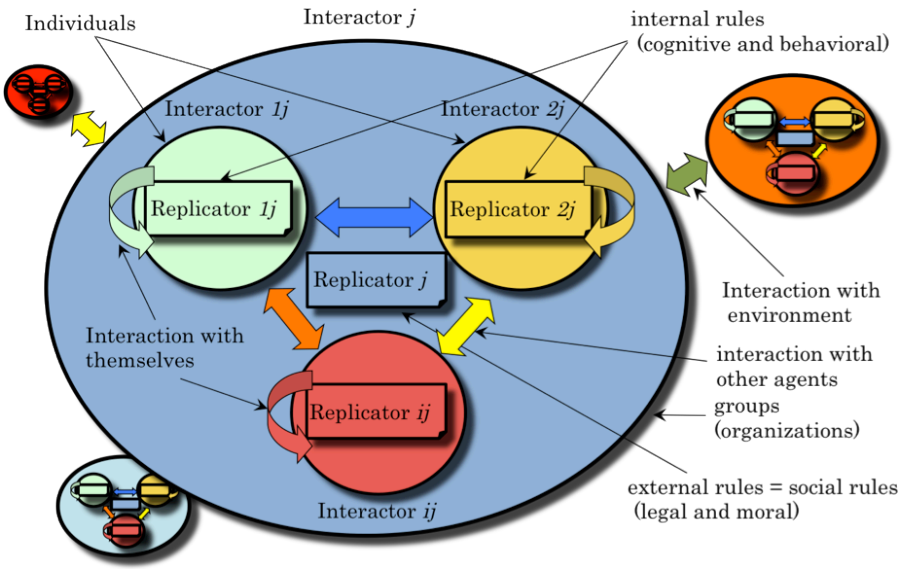

Fig. 2 Multilayered nested structures composed of replicators and interactors (Source: revised from Nishibe, et.al (eds.) (2010) p.80)

Here, we present evolutionist institutional design as such. Firstly, it is quite different from constructivist institutional design where central governments or planners from the outset construct and manage a whole economic system based on a comprehensive plan for achieving a desired outcome in terms of efficiency and equality in socialist central planning as well as mechanism design such as in market socialism or mechanism design. Secondly, it is also different from operationalist institutional design where central governments or planners directly control the resulting performance of a whole economic system by adjusting macroeconomic policymaking parameters in Keynesian 'fine-tuning' of effective demand.

In contrast to such conventional approaches, evolutionist institutional design (or media design) is where agents consciously attempt to redesign platform media that are basic external institutions in order to regulate the evolutionary socioeconomic system so that dual directional causality between internal institutions such as habits, conventions and value on the micro level and the boundary and performance of whole systems at the macro level can be induced to change. We would like to present evolutionist institutional design as a new idea and method for policymaking practices.

4.2 Socioeconomic Evolution: Replicators and nteractors

Here let us introduce several basic concepts and ideas in evolutionary economics so that we can use them to clarify the aims and significance of evolutionist institutional design. What are similarities and differences between biological evolution and socioeconomic evolution? Biological evolution in neo-Darwinism is conceived as a complex phenomenon involving the following three mechanisms: 1) variance via mutation, 2) heredity and 3) natural selection. In the case of socioeconomic evolution, considering the peculiar ability of Homo sapiens to learn from and communicate with each other by using language and money, we need to make some important revisions to the aforementioned model of biological evolution, even if we have three similar mechanisms: 1) variance via natural and artificial mutation (innovation), 2) replication/transmission of knowledge/information and 3) natural and artificial selection (competition and cooperation). If we add 4) self-organization as another mechanism missing in neo-Darwinism in order to explain how order spontaneously emerges and grows, we now have four independent mechanisms of socioeconomic evolution.

Fig. 2 depicts an example of a multilayered nested structure. Three individuals (interactors 1j, 2j and ij symbolized by three small circles) with their own replicators as internal rules for cognition and behavior (replicators 1j, 2j and ij symbolized by three small rectangles in small circles, respectively) belong to an organization (interactor j symbolized by a large circle) with its own replicators (replicator j symbolized by a rectangle at the center of the large circle) as external rules for laws, norms and morals.

Evolutionary economics has two basic concepts: 'replicators' and 'interactors.' On the one hand, replicators in socioeconomic evolution that correspond to genes or DNA in biological evolution are institutions that consist of a bundle of if/then rules shared by a relatively large number of agents. Such institutions constituted as rules are classified from the viewpoint of agents into 'internal' (game strategies, frames of cognition, psychological biases and behavioral routines) and 'external' (game rules, laws, conventions, norms and morals). On the other hand, interactors—causal agents that correspond to organism and groups or populations in biological evolution—are individuals or groups of individuals who execute rules (act

according to both internal and external rules) and interact with themselves and others as well as external environments. Then we can visualize our socioeconomy as coexistence of a diverse array of rules and institutions that form mutually complementary and substitutive relations. We call such a dynamic system the 'institutional ecology' (Hashimoto & Nishibe 2012).

In most cases, replicators and interactors form multilayered nested structures. Whereas individuals are agents with their own replicators as internal institutions (rules), such groups of individuals as organizations (firms), markets, communities and states are also agents with their own replicators that are preferentially imposed as external institutions (rules) on individual members as long as they belong to those groups. If some individual members cannot fully accept all the rules of the belonging group, in other words, any of the internal rules of the individual members conflict with the external rules of the belonging group, they must leave or be kicked out of the group. For example, as long as individuals belong to any group of individuals, they must obey some necessary basic rules of the group. If any individuals cannot follow the rules, they cannot belong to the group. The relations of groups (for instance, firms) and upper levels of groups are similar. The number of hierarchical levels in the nested structures is logically infinite, but in reality there are usual only several.

4.3 Micro-Meso-Macro Loop

We now present a simpler model with three levels—the micro-meso-macro loop model—to describe dynamic characters of an evolutionary system as in Fig. 3. Symbolically generalized communication media such as language, law and money can be regarded as platform institutions (basic replicators) located on the meso level in Fig. 3. Individuals as interactors on the micro level have their own replicators composed of internal rules such as instincts, characters, habits, routines, motives and value. Such platform institutions as money, accounting, company and laws are regarded as basic replicators (rules) located on the meso level because, as outer institutions, they affect such inner institutions as common value, moral and consciousness shared by a certain number of micro agents on the meso level, and, on the other hand, determine such internal rules within micro agents as the routinized frames of cognition and habitual rules of decision/ action on the micro level so that agents can behave based on such frames and rules. In short, platform media as outer institutions on the meso level basically regulate how agents share their morals, values and beliefs on the meso level and behave and interact with one another on the micro level. Platform media mediate dual directional causal relations between socioeconomic performances and patterns on the macro level and behavior of agents based on internal rules on the micro level.

CCs are integrative communication media located on the meso level and mediate dual directional causal relations between socioeconomic performance and patterns on the macro level and behavior of agents based on internal rules such as values motives and routines on the micro level.

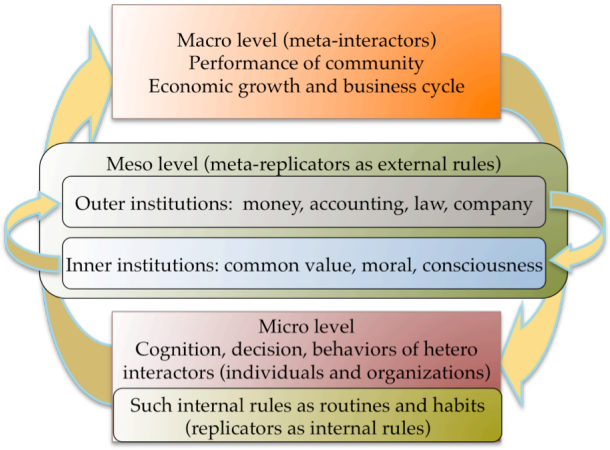

Fig. 3 Micro-Meso-Macro Loop
(Source: Nishibe &Kusago (2012)

5. CCS AS STRATEGIC PLATFORM MEDIA IN EVOLUTIONIST INSTITUTIONAL DESIGN

If we set new rules or revise some rules of CCs as platform institutions on the meso level, such a change would affect socioeconomic performance and patterns on the macro level because agents change their behavior in response to the change of external rules even though agents keep internal rules such as frames of cognition, motives and routines unchanged. Even though agents follow the same internal rules written as if/then statements, if any input conditions change in the conditional clause (if~) including any change in external rules, they might change their behavior as output in the main clause (then…) according to the change in the conditional clause.

But if any modification of external rules as platform institutions on the meso level changes internal rules such as values, motives and routines of agents on the micro level, they eventually have changed their 'ways of behaviors,' not 'behaviors as output' in the same internal rules.

For example, let us assume that you always behave as a utilitarian according to the rule of maximizing your utility, and if the criminal laws are amended to allow you to steal anything from others without penalty, you are supposed to start stealing things to maximize your utility, rather than to pay money to buy things. But if you were taught the moral standard that stealing is not right because it hurts others, and therefore refrain from stealing, you would ultimately give priority to the moral standard rather than the utility maximization rule and you would not behave as a utilitarian. This means that you would not change your behavior itself—you did not steal before or after amendment of the law; instead you change your internal rules, that is, your ways of determining how to behave.

After all, the change of external rules on the meso level can affect not only performance on the macro level but also internal rules on the micro level. Both constructivist and operationalist approaches of institutional design presume that such internal rules on the micro level are all fixed because such internal rules are given by optimality principles such as maximization of utility and profits. The constructivist approach, on the one hand, aims at constructing systems or structures on the macro level based on utilitarian behavioral principles imposed on agents on the micro level. The operationalist approach, on the other hand, makes macroeconomic models with several sectors and aims at social engineering to discretionally control such fluctuations and instability of the system, such as business cycles and inflation/deflation on the macro level.

However, different from those, the evolutionist approach thinks of internal rules on the micro level as variable, and tries to consider the effects both on performance and patterns overall at the macro level and on internal rules at the micro level; these effects arise simultaneously from changes in the policymaking regarding external rules embodied in platform institutions (e.g., media such as money) and from changes in accounting rules at the meso level.

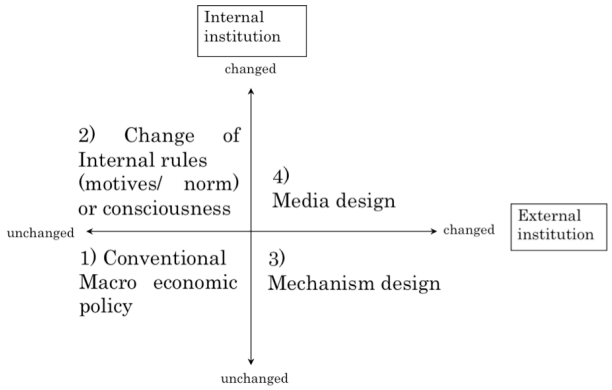

Fig. 4 Classification of four types of socioeconomic policies (Source: Nishibe (2010) p.249)

Fig. 4 classifies socioeconomic policies into four categories along two axes of changed/unchanged for internal or external institutions. Here, evolutionist institutional design corresponds to 4) 'media design' where both external and internal institutions are changed. In contrast, constructivist institutional design is understood as 3) 'mechanism design' in which only external rules are changed, and operationalist institutional design is depicted in 1) conventional macroeconomic monetary and fiscal policies where neither rule is changed. We can see 2) 'change of internal rules or consciousness' in ethical consumption, social investment and corporate social responsibility. These are all socioeconomic policies, but our focus is especially on 4) 'media design' based on evolutionist institutional design.

To make our socioeconomy more sustainable without the intolerable instability and turbulence of a financial capitalistic market economy, we can use media design as a policymaking tool to implement special districts, social experiments and local movements specifically in terms of money and credit as economic media on the meso level. But it is crucial to examine what set of rules of money and credit are better suited to accomplishing certain aims, for example, preventing excessive economic fluctuation and achieving socioeconomic stability by referring to modern experiments of various kinds of CCs.

Conventional national currencies are the platform institutions that determine the grand design (basic replicators) for the capitalistic market socioeconomy to evolve. In contrast, such currencies, CCs can be thought of as different kind of platform institution with different basic replicators that can gradually change both external and internal institutions of agents and can potentially evolve from a capitalistic market socioeconomy to noncapitalistic market economy. But even so, the reality is that CCs have only weak capabilities for survival and diffusion. We should thus examine in regard to media design what kinds of other external institutions can coexist with CCs or create a favorable environments for them in order to empower CCs.

6. STRATEGIC POLICYMAKING MODELS OF EVOLUTIONIST INSTITUTIONAL DESIGN: MEDIA DESIGN AND COMMUNITY DOCK

If we introduce CCs that possess the dual purposes and properties of both money and language, we can interpret it as revision of the replicators concerning external rules for money on the meso level. According to the aforementioned dynamic character of the micro-meso-macro level of the system, the introduction of CCs as platform media on the meso level affects both the performance and patterns on the macro level and the internal rules within agents on the micro level. In evolutionist institutional design, we need to consider both aspects at the same time, and implement media design of CCs so that they can improve the macro performance and become more viable from the perspective of business management. Furthermore, it would be desirable from the strategic viewpoint to recognize and evaluate the changes of participants' internal rule caused by the introduction of CCs, and make use of such feedback in order to improve the design of CCs that can induce further desirable changes.

Fig. 5 shows such strategic policy-making models for evolutionist institutional design. While media design is located on the upper level within evolutionist institutional design, community dock is located on the lower level. They form the nested structure of evolutionist institutional design.

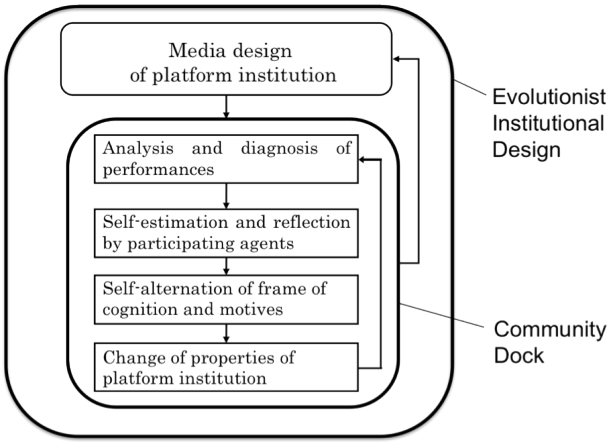

Fig. 5 The nested structure of media design with community dock (Source: Nishibe 2006a)

6.1 Media Design

When we use the term 'media design' in a broad sense as a synonym for evolutionist institutional design, it generally indicates a new idea and method of institutional design. So it concretely signifies policymaking methods (e.g., special districts, subsidies and reforms) in terms of media such as money, laws, accounting rules and sciences. But we can also use the word 'media design' in the narrow sense to indicate the process of design of any specific medium like CCs within the framework of evolutionist institutional design in Fig. 5. In this section, we will focus on the broad sense first and the narrow sense thereafter.

The constructivist institutional design known as 'mechanism design' considers internal rules within agents (consumers and producers) as fixed optimality principles (utility or profit maximization). In constructivist institutional design the market is understood to be the 'concentrated mechanism' precisely embodied in the 'price mechanism' in only an ideal sense and the market is evaluated accordingly in terms of efficiency of resource allocation and information transmission as well as incentive compatibility in order that the outsiders of the system can construct an optimal 'auction mechanism' based on the criteria.

In contrast to this, 'media design' conceives internal rules within agents as consisting of relatively simple routines, motives and values in order to provide satisfaction, not maximization, subject to realistic constraints such as irreversible time and bounded rationality of agents. Further, media design takes the market to be more realistically 'decentralized networks' of arm's length transactions for buying and selling mediated by money and accordingly evaluates the market in terms of reproduction, development and diversity of social and ecological systems, satisfaction of effective demand, and systemic stability and robustness of macro performance. Media design thus enables the participants of the system to design more desirable media as money, CCs, and the like. In other words, media design is not a phenotypic approach that attempts to directly construct (rather than design) the mechanism itself with desired functions and properties, but rather a genotypic approach that designs media as institutions (replicators) that indirectly induce desired functions and properties which are manifested by themselves.

Let us now to take a closer look at the idea of institutional ecology to elaborate on the wider sense of media design. In the age of globalization, a commonly held notion is that money will move toward a single currency because of the effects of network externality in consideration of efficiency and convenience (Arthur, 1994). The dominance of the U.S. dollar as a key currency in the world economy is in many cases cited as an exemplification of the claim. However, the euro was created as a transnational currency to counter the U.S. dollar's dominance and the currencies of the BRIC countries have increased in value. In Japan, there are diverse currencies with specific properties and niches, such as national currency, corporate money (mileages and points), electronic money, local currencies and local coupons (gift certificates). Thus, a single dominant currency is not complete and the coexistence of various monetary institutions is currently observed just as institutional ecology suggests.

Monetary institutional ecology is an ecosystem where groups of monetary institutions and groups of users who strategically use multiple moneys co-evolve (Hashimoto & Nishibe 2012). Such modeling can better explain the stylized facts that globalization and localization of money simultaneously proceed and multiple species of money continue to coexist. And we cannot conclude that media design in term of multiple currencies including CCs will open a new field in socioeconomic policy until we can see the world from such a standpoint.

Under such a theory of applied policymaking, we do not necessarily have to recognize globalization and its problems as inevitable facts. Then we need neither to think that there are no other effective methods than to deregulate the market and open it to foreign countries, nor to patch over each problem temporarily by adjusting fiscal and monetary policies when financial crises and recessions occur. Instead, it would be wiser in the long run to conduct media design to encourage various CCs to emerge and to aim at building a sustainable and recycling-oriented socioeconomy from the perspective of reproduction rather than efficiency so as to improve modern socioeconomic constitution by redesigning platform institutions of money and credit. Next, we will focus on several examples using CCs for media design in the narrower sense.

Firstly, there have been many attempts to redesign the rules of CCs in order for them to be more sustainable. In the case of Eco-money, a Japanese CC that came into use in the late 1990s for only volunteer activities and mutual aid, there was a problem that currency circulation is hindered by such noncommercial transactions. If Eco-money could be used for commercial transaction for local shoppers as well as local firms, governments and nonprofit organizations, double circuits of CC driven by the complementarity of noncommercial and commercial transactions, wide cir-

culation could be achieved more smoothly. In an experiment on a CC in Tomamae Town, Hokkaido, the velocity of the CC with the 'Double-Triangle Method' was found to reach 5.1 (first experiment, Oct. 2004 to Feb. 2005) and 3.5 (second experiment, Aug. 2005 to Jan. 2006) turnovers per year, which respectively correspond to about 6–7 and 4–5 times that of the legal tender at the time. These data support our claim that the CC of such a method can have significant economic effects in vitalizing local economies (Kichiji & Nishibe 2008).

Let us take another example of media design of CCs in which administration bodies attempt to change the properties of CCs by adjusting various parameters. During the 2000s in Japan, local coupons issued by local governments and chambers of commerce flourished. Many consumers were willing to purchase local coupons because they went for a premium between 2% and 10%, subsidized by local governments. At the time, the Japanese central government had created several special districts for CCs to deregulate laws that placed conditions on the issuance and circulation of such coupons. It also encouraged CCs to take the form of redeemable local coupons as in Tomamae Town's CC. In this case, media design mainly targeted how to adjust such parameters as the rates of premium, demurrage (negative interest) and redemption fee, in addition to the choice between note-type and account-type CCs. The higher the premium, the more willingly local consumers bought the CC. The higher the demurrage, the faster consumers spent the CCs, consuming instead of hoarding. The higher that of redemption fee, the more times consumers circulated CCs without redeeming them. Accordingly, it is effective to raise the rates of premium, demurrage and redemption in order to encourage supply, turnover and local circulation of CCs. If local governments issue CCs, they will have policymaking tools for adjusting the local money stock similar to the ones that a central bank has for a national money stock.

6.2 Community Dock

'Community dock' is designed as part of evolutionist institutional design for embodying a strategic and comprehensive method for integrating self-estimation of socioeconomic situations of the community and self-alternation of such internal rules as frames of cognition, motives, values and norms for participating agents of CCs. It was devised to be analogous to 'human dock,' which is a Japanese term that means a periodic complete medical checkup for early diagnosis and self-awareness of lifestyle problem, because lifestyle-related diseases are widely observed in many communities. Similar to human dock, community dock not only aims at accomplishing objective observation and data analysis of the present state, but also puts emphasis on participants' self-awareness, self-estimation and self-alternation (Nishibe 2006a, Nishibe & Kusago 2012).

Once policymakers or administrative agents establish external institutions of CCs in media design and participants conduct transactions using CCs, community dock will commence. It is composed of the following four processes: 1) analysis and diagnosis of current performance of the socioeconomy of a community given data collected by third-party researchers and advisers, 2) self-estimation and reflection on the performance of the community and their own internal rules by participating agents, 3) self-alternation of frames of cognitions, motives, values and norms by participating agents, and 4) change of properties of CCs as platform media caused by alternation of internal institutions of participating agents.

The loop of community dock is encompassed by the whole processes of media design of CCs in Fig. 5. After sufficient numbers of repetitions of community dock with the same CC rules, policymakers or administrative agents might fine-tune or reform external CC rules based on accumulated experiences and updated diagnosis so that they can adapt the altered internal rules of participants and attain the initial goals more effectively. Media design in the narrow sense is thus situated on the upper level of community dock in the overall picture of evolutionist institutional design, that is, media design in the broad sense.

We conduct analysis and diagnosis in community dock by using both subjective data such as results of questionnaires, interviews and discussions and objective data such as details of transactions, turnover of money, and properties of the money circulation network among participants. While the economic effects of CCs can be ascertained from their turnover or network of circulation by using the data about each transaction (date, item, from, to), their social and cultural effects can be ascertained from the observed changes of participants' consciousness and values. For example, we conducted network analysis of CC circulation among agents and regions by using data filled in on the back of notes by participants in the Tomamae Town experiments (Nishibe 2005; Kichiji & Nishibe 2008).

Even though analysis and diagnosis are done by using objective data, whether such data can be obtained actually depends on whether participants are willing to provide them, that is to say it depends on participants' internal rules including frame of cognition, motives and values. It is thus significant to pay attention to the dynamic process created by implementing community dock. In evolutionist institutional design, the change of participants' internal institutions affects not only macro performance of platform media or external institutions but also its analysis and estimation. Its effectiveness thus depends on volunteer participation and the proactive attitude of agents. Community dock as a policymaking method is not top-down from policymakers, but rather bottom-up from participants.

The framework of evolutionary institutional design is thus established so that we can more deeply understand both theoretical and practical aspects of CCs from more realistic viewpoints of evolutionary economics. We believe that this framework can provide a more suitable method of self-management of CCs for their practitioners.

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