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THE THEORY OF RECIPROCITY AND OF THE CHOICE OF ECONOMIC SYSTEMS: AN INTRODUCTION

Serge-Christophe KOLM*
Institute for Advanced Studies in the Social Sciences, París

This article 1) analyzes the effects of preferences between modes of economic realization (or «systems»), 2) presents the theory of reciprocity, 3) applies the results obtained to the choices between reciprocity and other systems (markets, coercive planning). The modes or systems matter both for their strictly economic performance and for their direct qualities concerning freedom, relations, attitudes, the nature of society and of man. Reciprocity is a varied type of two-ways transfers in between gift and exchange; the gift/return-gift is an elementary form, but steady relations are important. Return-gift functions, «equilibria» and «solutions» are the basic concepts of reciprocity analysis. Voluntary shifts from reciprocities to market exchanges characterize «modernization» or «development», with the «paradox» of the «autarky of reciprocity» whereby the loss of the intrinsic quality of economic transfers is accompanied by larger transfers. Violations of this latter property are explained by other phenomena (information, endogenous preferences).

1. Introduction

Goods, services or claims can be transferred (provided) from individuals or agents to others in various modes or ways, such as through exchange, by force, or as gifts, with many possible specifications. This mode matters for two reasons. First, it limits the possible sets of transfers. For instance, a free or voluntary set of transfers is (by definition) preferred to its absence (i.e., zero transfers); exchange implies a pair (at least) of transfers; force may imply the wastes of coercive action, resistance or shirking, etc. Indeed, if the mode is defined in sufficient detail, it determines the actual transfers (e.g., with detailed description of bargaining or competition for exchange). Second, given the amounts transferred, this mode commonly matters to the people concerned, often very much. It is not a matter of indifference for one to give a hundred dollars or to be robbed of a hundred dollars; to receive a kind gift worth a hundred dollars or to obtain this amount through haggling or threat; to work freely or by force; to provide «sexual services» through love, prostitution or rape; to either give and be given back, or exchange, or be stolen from and retaliate, etc. (Indeed, people sometimes so value the relational, symbolic or attitudinal aspects of

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a transfer that they exchange or give one another identical things, such as wedding rings, drinks or meals, a strange behavior from a narrowly economic point of view.) Altruistic transfers (Kranish, 1988), or some altruism in exchange, may destroy market efficiency[1] (Kolm, 1983, 1984), yet the intrinsic value of these sentiments, attitudes and human qualities may overcompensate this loss.

This topic is of utmost historical importance, since processes of economic «modernization» or «development» consist essentially in replacing by markets, or by planning, economic systems that belong mostly to the realm of «reciprocity» (see below). Note that since transfers by definition involve several agents, the choice of a mode always concerns several agents even when it is voluntary.

A set of transfers with similar modes is an homogeneous «economic system». Most actual economic systems are heterogeneous, with coexistence of modes of various types, although usually one type dominates or at least is conceived as the «normal one», the others being seen as exceptions to it even when they are quite widespread. The broadly classified types are exchange and the market, coercive planning or command and the public sector[2], and gift-giving and reciprocity. Economics, the science of these transfers, has studied the market extensively and planning abundantly. It contains a literature on altruistic gift-giving (including «charity», «the grant economy», etc.) but is has been virtually silent concerning reciprocity[3]. On the contrary, reciprocity is a, or the, central concept in Anthropology (somewhat like pure exchange for Economics). It is also common in Sociology, and a number of sociologists hold that reciprocity is the central fact and the essence of man in society, the basic glue that holds individuals together (see, for example, Gouldner, 1960). Yet, for all the richness, depth and subtlety of anthropologists' and sociologists' analyses, they usually lack two valuable aspects of those of the economists: one is the working out of logical implications, essentially thanks to the building of formal models; the other aspect is the close integration of the normative question within the analysis. Now, an economics of reciprocity is central to the understanding of many very important economic questions such as: the economy of the family, development, the oriental firm, cooperatives, orga-

[1] Egoistic behavior on efficient markets leads to altruistic Pareto-efficiency only under particular conditions concerning the structure of individuals' preferences, the behavior of the individuals, and the information and distributive possibilities of a policy-maker (see Appendix).

[2] Command within firms whose employees are recruited on the labor market can be seen as implementation of the labor contracts that are free exchanges (a freedom subjected to the Marxian proviso that one may have to work in order to live). We also do not introduce here the exchange theories of the public sector, either positive ones (e.g. «Public Choice» theory), or normative ones (e.g. the «Liberal Social Contracts» in Kolm, 1985, 1987).

[3] See, however, Kolm (1975, the 1984 book), Sugden (1984), Akerlof (1989), Swaney (1990).

nizations, firm loyalty, efficiency wages, cooperation, voluntary restraint, etc. (see below).

This article proposes the basics of economic theories of reciprocity and of the choice of economic systems, and it applies results of the second to the first. It answers questions such as the following. What are the key concepts of an economics of reciprocity? What are the relations between preferences for systems *per se* and preferences concerning allocations or transfers? What effects has a replacement of reciprocity by markets or by planning on the volume of transfers? Can one explain why, in these changes, free transfers become more important when they are less appreciated *per se*? If we can, then how can we explain the cases where the opposite effect holds?

The article is organized as follows. Section 2 presents the nature and scope of reciprocity. Section 3 considers the value of economic systems when one takes into account not only the resulting production and distribution but also the quality of the process itself for reasons of freedom, human relations, etc. Section 4 presents basic reciprocity processes, namely the gift/return-gift and myopic or cumulative longer processes, and the basic concepts of reciprocity analysis: return-gift functions, solutions and equilibria. Section 5 focuses on the quantitative case where each individual gives some of his good (e.g., labor) to the other, it studies equilibria and solutions and compares their allocations, and it points out that the apparent inefficiency of these outcomes is not *per se* a real inefficiency since other outcomes require other systems. Section 6 considers in this framework the question of the choice of systems; it shows why, although transfers have an extra relational value in a good reciprocity, they increase in a voluntary switch toward markets (or planning); hence, when they decrease and the switch still appears to be free, there is «system illusion», which can stick a society in a sub-optimal system if it plays through endogenous preferences.

2. Nature and scope of reciprocity

The literature does not provide a precise definition of reciprocity, and this concept is often given different extensions. Yet, one can easily identify a central and common core of meaning and of phenomena that this notion describes, along with the main and characteristic properties of these facts. The elementary reciprocitarian experience is the gift/return-gift relation, whereby someone receives a free gift, then voluntarily gives something back, without obligation except possibly a moral one, and usually with a resulting overall sense of good relationship. The name reciprocity applies still better to a steady sequence of such relations, where each transfer could count both as the return gift of the preceding gift (or of past ones) and as an initiator of future return gifts. More generally, reciprocity between two agents is a *set of independently voluntary* (free) but psychically related *two-ways transfers*. *Independent voluntariness* means that each transfer *separately* is voluntary or free, in particular *none* is a *condition* of another, a necessary payment for it, a due or the result of a commitment, by *external* obligation

(there might only be an internal, mental sense of due or of moral obligation to «give back» something).

This distinguishes reciprocity from classical *«exchange»* –a term that includes market exchange and barter but that we shall take as excluding reciprocity. Exchange is also a set of related two-ways transfers between two agents. It is also voluntary, yet this voluntariness is global, for the whole set of transfers, rather than being independent for each transfer. That is, the transfers of an exchange are *conditional* on one another. Once one transfer of an exchange is made, the corresponding, agreed upon transfers in the other direction have to be made by *external obligation* (possibly enforced by law). This is not the case with reciprocity. Yet, both reciprocity and exchange are also globally voluntary and in this sense they both oppose pure coercion. We see that liberty is larger in reciprocity than in exchange since it exists for each transfer separately, whereas in exchange transfers are compulsory when the other ones are made (we speak here of external liberty, not of internal sense of obligation for appropriateness or duty). In this sense, exchange can be said to be intermediary between coercion and reciprocity with respect to liberty.

On the other hand, reciprocity is to be distinguished from pure gift-giving, since it involves several inter-related transfers in both directions, whereas pure gift-giving is a single isolated one-way transfer. Yet, in both cases the transfers are voluntary, even independently voluntary. Therefore, reciprocity can be considered as intermediary between exchange –both imply several related two-ways transfers–, and pure gift-giving –in both the transfers are independently voluntary.

The following table summarizes this discussion[4].

<table>
<tr><td>COERCION</td><td>EXCHANGE</td><td>RECIPROCITY</td><td>PURE GIFT-GIVING</td></tr>
<tr><td></td><td colspan="3">globally voluntary</td></tr>
<tr><td colspan="2">coercive intra-relations</td><td colspan="2">independently voluntary</td></tr>
<tr><td colspan="3">inter-related two-ways</td><td>independent one-way</td></tr>
</table>

Reciprocity is based on, and motivated by, a sense of appropriate balance between what is transferred both ways. The social relations and social sen-

[4] Needless to say, this typology of *modes of transfers* bears *a priori no relation to the types of goods* (commodities, services) that are transferred. However, paticular *cultures* establish as norms such correlations, some of which commonly are important aspects of the culture (for instance, particular services or goods must be transferred as gifts –perhaps in reciprocity– rather than sold and bought, etc.). These cultural traits can change, and these modifications are often important aspects of overall cultural changes (notably in «modernization»).

timents that accompany reciprocity are essential both for its working and for its normative aspect. They create the desire to reciprocate. These sentiments and relations can be varied and mixed. Strong norms and heavy moral social pressure can be disagreeable or even oppressive (indeed, opinions of others can cover the whole spectrum from being of no concern to the individual, or from not being really different from his own view of himself, to amounting to genuine external obligation). Yet, most of the time, reciprocity is accompanied by a sensation of good social relation and by sentiments going some way in the direction of altruism. A sense of moral indebtedness, gratitude, a desire to continue the relation either for material interest or *per se* can play roles in various degrees. In imbedding the transfers within these social sentiments and relations, reciprocity generally has at least some aspect of a «total social fact» in the sense of Marcel Mauss' *Essay on Gift.* Contrary to exchange and coercion –but along with pure gift-giving– reciprocity cannot be explained *only* by pure, simplistic, elementary material self-interest for the outcome of the relation.

Indeed, in accordance with most of the literature, we *define* reciprocity in such a way that these motivational and relational aspects are required. That is, the situation is *by definition* not one of reciprocity if they are absent. This differentiates a gift/return-gift from an exchange. Similarly, a sequence of alternate transfers in both directions, each motivated by the desire that the relation continue, but otherwise purely materially self-interested, is not classified as reciprocity but as exchange. Hence, by its very definition, reciprocity is neither what economics usually studies as exchange, nor a sequential game as game theory classically models it. The basic difference is a greater psychological richness in the case of reciprocity. However, reciprocity has a strategic dimension, as any interaction among humans who consider others' thoughts. But this dimension is not the one that is characteristic of reciprocity and specific to it (hence not the one that should be refined in the simplest models of the «pure theory» of reciprocity).

In particular, sentiments of reciprocity can modify the outcome of games. They are notably bound to favor cooperative behavior and make it self-sustainable. They can thus palliate the absence (or cost) of commitments supported by coercion. As a result, a reciprocitarian behavior, that is not exclusively motivated by the material outcome for oneself, may be better from this very latter point of view. For instance, if I need help in a situation where I can pay only later and where self-coercive commitment is not possible, a self-interested helper does not provide the assistance if he foresees that I shall not pay because it will then be against my self-interest, whereas he may help if he knows that my reciprocitarian sentiments will induce me to return the service (promise keeping is an alternative solution, yet a psychologically different one). Similarly, the purely self-interested sequence of alternate gifts described above cannot be sustained between agents that correctly foresee the future, because of «backward induction» –the last gift has no reason to be implemented, if it is not, then the last

but one gift has no reason to be implemented, and so on until the present gift (an endless sequence is not realistic). Now, a sentiment of reciprocity can induce the last gift (there will for instance be the same number of gifts in each direction)[5].

Reciprocity is obviously a very important, widespread and varied economic and social phenomenon (so are exchange and coercion). It is the main economic system at work within families (although exchange and coercion may also be present). It is common within all organizations. Traditional economies work principally on the basis of reciprocity relations. Cooperatives commonly pride themselves on being systems of reciprocity with the corresponding specific social attitudes and sentiments (yet, not all cooperatives –and cooperation– involves them and hence involve reciprocity as defined here). In a number of cases, reciprocity characterizes the relation between an organization and its employees, with sentiments of loyalty toward the organization and «paternalistic» care of the employees by the organization (the Japanese-type firms are probably the most important case nowadays –Chinese firms are commonly more or less family concerns, hence also based on this type of reciprocity; this shows again that reciprocity may be very favorable to efficiency). A presentation of the various manifestations and forms of reciprocity is to be found in the book Kolm (1984) –that also includes extensive referencing on this topic.

Therefore, the analysis of reciprocity is essential to the study of a number of very important topics in economics, in particular the following ones (the presence and importance of aspects of reciprocity in all these cases does not suggest more similarity between them).

1) The economy of families and households.

2) The analysis of traditional economies.

3) Development that rests on traditional economies, or, more often, transforms them into more «modern» systems of market exchange or planning. The analysis of reciprocity then is necessary both for description, explanation and understanding the possibilities, and for considering the normative aspect of the process of development.

4) The theory of organizations, in particular of firms and of bureaus.

5) The theory of cooperatives.

[5] The sequence of alternate gifts and backward induction have been considered by P. Hammond (1975) and M. Kurz (1978, 1979). As is well-known, backward induction with self-interest can be overcome by uncertainty concerning the end of the process (Radner, etc.), or by and hypothesis of bounded rationality. With regard to the scope of the concept of reciprocity, M. Sahlins (1972) calls revenge and retaliation «negative reciprocity»; we do not consider this case here. Furthermore, the motivational aspect has led us to include the limit case of pure gift-giving within reciprocity in Kolm (1984).

6) The theory of firms with firm-employee loyalty, in particular the theory of oriental firms (at least in their Japanese and Chinese varieties).

7) Efficiency wages and the theory of involuntary unemployment. Indeed, numerous experiments and empirical studies have shown that, when an employer unilaterally decides to increase wages, most of the time the employees react in increasing the productivity of their labor. The reason is the maintenance of a sense of balance between pay received and work provided (see Adams and Rosenbaum, 1964, Adams 1965, and the literature quoted in Kolm, 1990). This reaction typically belongs to the realm of reciprocity. If the employer makes the best of it for his profit (hence this side may not be motivated by reciprocity), the result is an «efficiency wage» that can explain «involuntary unemployment» (hence the necessity of stabilization policies). This is the essence of Akerlof's 1982 study.

8) Comparison and choice of economic systems.

9) Sugden (1984) uses the word «reciprocity» for describing the mutual voluntary provision of non-excludable public goods (non-free-riding). The social behavior he considers has an aspect of mutual gift-giving since each contribution benefits the others as well as its contributor. And this behavior and its study are obviously important. Yet, as a merely semantic point, one may wonder whether the name «reciprocity», in its usual understanding, fits as well as it does for the mutual gifts of private goods considered below («balanced, or fair, cooperation» may be more fitting).

10) On the other hand, the name «reciprocity» seems to become more fitting when the final mutual benefits are more individualizable. For example, mutual voluntary restraint in the use of exhaustible property can certainly result from reciprocitarian attitudes and behavior, and Swaney (1990) rightfully considers this situation.

Let us finally note that a number of economists want to explain (and sometimes also appraise) all social situations from the behavior of individuals exclusively interested in the material outcome concerning themselves only. This deserves the following judgment. If it denied the existence, or the influence on behavior –indeed, the paramount influence in certain cases– of facts such as love, affection, duty, honor, hatred, revenge, gratitude, faithfulness, and so on, then this position would be absurd, as anyone can see in looking around (and, perhaps, within himself). On the other hand, this position can be valid if it consists only in the research program of trying to investigate the scope of what the assumed simplistic motivation can explain, in particular when it is associated with more refined analysis of expectations and strategies. However, in studying a specific actual case, other motivations should not be discarded when they manifestly exist. The fact that actors commonly express reasons for their actions that are not the true ones does not imply that only the narrowest end-state self-interest is at work in all cases. Yet, it is also clear that in many cases, there can be much uncertainty concerning which motivations are the true ones and

what is the actual scope of each. Then, the scientific position requires one to have theories for all the possible cases and not for only one. Finally, the argument that only self-interest in the outcome can be studied by formal models –hence enables one to make use of this powerful tool– is simply erroneous; not only preferences on others' allocations (altruism, envy, etc.), but the whole process can be considered in this way (indeed, can even be studied with the hypothesis of «rational» maximizing behavior and evaluation); the first steps of the economic theory of reciprocity and of «system preferences» –presented below– prove at least this.

3. Choice of economic systems

This section and the next one present basic concepts that are applied in the subsequent sections.

3.1. General preferences

We may have to consider three types of individuals' preferences, distinguished by their objects.

1) *Allocation preferences* are preferences on allocations, that is, the preferences usually considered, adding, however, that an individual can have preferences not only on his own consumption goods or possessions, but also on those of others for any reason (altruism, envy, etc.).

2) *Transfers preferences* are preferences on transfers (or provision) of goods or services, not merely because of resulting allocations. For instance, people may enjoy the gifts they give not only for what the beneficiary finally has (given the cost to them)[6].

Allocative preferences denotes both *allocation* and *transfers* preferences considered as two kinds of motives for the same preferences that bear on the same set of variables. These variables are either the transfers or the final allocations, that are related one-to-one given the initial allocations (the final allocations are the initial allocations plus or minus the transfers).

3) *System preferences* are preferences on the modes of transfers and of economic realization. For instance, one may prefer that the same transfers be achieved by a gift and a return-gift rather than by a purely egoistic exchange or by forced redistribution[7].

The reasons for system preferences are many and sometimes strong. Among them are the existence and type of interpersonal relations, attitudes, contacts, sense of community that accompany the transfers; valuing freedom *per se* (or on the contrary disliking the responsibility and the

[6] Cf. Kolm (1975, 1984), Margolis (1981), Andreoni (1989), etc.

[7] Cf. Kolm (1984), also Margolis (1981).

necessity or costs of choice it creates)[8], the possibility of conforming to norms or of distinguishing oneself that the transfers afford, etc. Living in a system may also influence or shape preferences one way or another, so that the system may also be a parameter –and not only an object– of preferences; these two forms of influence need not be distinguished until the last section[9].

A basic dilemma is that allocative and intrinsic qualities of a system may not go hand in hand. This is hardly surprising. Harsh incentives, eager competition, individualistic drive for profit, have well-known virtues for classically defined economic performance, yet may be detrimental to quietness, serenity, contemplation, friendly social relations, the search for consensus, caring for others, the stability and predictability of normed behavior, etc.

«Rational» individuals have an integrated preference ordering over these three kinds of elements. Since allocations result from transfers, we can –as noted above– aggregate these two reasons into «allocative preferences» and describe their object by the set of transfers denoted t. We denote by $t = 0$ the absence of these transfers. We denote by s (for «system») the considered mode of realization of these transfers. An individual's preferences bear on the pair (s,t). They are represented by the ordering denoted by $\succ$ (preferred), $\sim$ (indifferent), $\succsim$ (either one or the other).

3.2. Structure of general preferences

a) System preferences

We say that *there is system preferences* when there exists a triplet (t,s,s') where s and s' are two particular systems, such as $(s,t) \succ (s',t)$.

[8] This preference for freedom *per se* is analyzed in Kolm (1982).

[9] Living in a system may create habit, or, on the contrary, aversion, for the actions, and notably modes of transfers, of this system, and for this system as a whole (apart from differences in information about systems). These actions may be others' and one's own. One's own types of actions may be induced by others' actions or opinions (that induce norm-following), or they may result from education, or they may be induced by imitation. In fact, the system and individuals' preferences have numerous ways of influence, in both directions. They are also both influenced by various other aspects of society. Indeed, they are both important parts of the same integrated culture. One can thus describe preferences as being parametrized by the system –in addition to the system being also a direct object of preferences. The widespread aversion to considering the formation and endogeneity of preferences in the economists' subculture (there are exceptions) is justifiable neither by facts, nor by the expert information of psychologists or sociologists, nor by a definition of borderlines between disciplines that would be arbitrary and unwarranted. However, treating parameters of preferences as objects of preferences *for certain uses* of preferences implies an extra hypothesis. This hypothesis is not necessarily satisfied, but it sometimes is. It for instance is, for eudemonistic preferences (i.e. when «preferring» means «being happier with»), when the individual can say «I would be happier (or less happy) had I these other preferences or tastes».

b) THE CONDITION OF EFFECTIVE TRANSFERS

System preferences –we noted– have several possible reasons. An important class of reasons requires that the transfers are effective, i.e. $t \neq 0$. They are those that rest on the quality of the relation that is created by these transfers. This is notably the case for an advantage of gift-giving relationship accompanied by positive sentiments over pure exchange and the use of force (indeed, in extreme but not uncommon cases, these sentiments are the basic reason for the transfers). There exist, of course, other cases, for instance when the pure attitude toward others is felt as important even if $t = 0$, or when $t = 0$ could be either a free choice or an imposed situation and freedom is valued *per se*. Our particular concern with reciprocity and its comparison with exchange leads us to consider notably the cases where the *condition of effective transfers* holds, that is where $(s, 0)$ and $(s', 0)$ *de facto* denote the same situation, hence where

$$(s, 0) \sim (s', 0).$$

c) UNIFORM SYSTEM PREFERENCES

Ordinal preferences on s for given t are unlikely to depend on t $(\neq 0)$ at least for the cases that we shall consider and that oppose more or less altruistic or communitarian «reciprocity» to egoistic and cold market exchange and to forced transfers. We therefore say that *a system s is preferred per se to another system s'* when

$$(s, t) \succ (s', t) \text{ for all } t \neq 0. \qquad [1]$$

(The condition $t \neq 0$ is here for the cases where the condition of effective transfers hold.)

On the other hand, preferences on t for given s are more likely to depend on s, in particular in the measure in which the system s shapes preferences (see note 8). For instance, higher tranfers to others may be preferred with more altruistic preferences and disliked with more egoistic ones.

3.3. Per se and total system preferences

As we have noted, the system s may influence the realization t. It indeed even determines it if the «system» is described in sufficient detail, since this description includes that of the actions, hence of the interactions and processes, that lead to the set of transfers t. Assume this to be the case and write this relation as $t(s)$. Then, we say that *the system s is preferred to the system s'* when

$$[s, t(s)] \succ [s', t(s')]. \qquad [2]$$

Now, relation [1] implies relation [2] if either

$$[s, t(s)] \succsim [s, t(s')] \text{ and } t(s') \neq 0,$$

or

$$[s', t(s)] \succsim [s', t(s')] \text{ and } t(s) \neq 0.$$

We therefore have the following property.

PROPOSITION 1. *A system that is preferred per se to another one is preferred to this other one if its transfers are preferred or indifferent to the transfers of the other with either one of the two systems (and transfers actually exist in the remaining system).*

We shall in fact apply this proposition in its following negative form.

PROPOSITION 1'. *If one system is preferred or indifferent to another although this other is preferred per se to it, then its transfers are preferred to those of the other with each system (when transfers actually exist in the remaining system).*

These preliminary results (lemmas) will be applied below to more explicit economic systems. However, since one of these systems, reciprocity, has yet been little analyzed with economics' tools, we must begin by showing the essence of its logic.

4. Outline of a theory of reciprocity

The detailed modeling of reciprocity may consider many specific cases (as is the case for exchange or for coercion). The following discussion suggests an outline of various possibilities and questions.

4.1. The gift/return-gift

The next degree after pure gift-giving is the basic gift/return-gift relationship. Assume two individuals, 1 and 2. Individual 1 gives the gift g_1 to individual 2. Individual 2 then reciprocates by giving to individual 1 the return gift g_2 that *a priori* depends on g_1, namely, $g_2 = f_2(g_1)$. The function f_2 is called individual 2's *return-gift function.*

The two roles could be inverted with individual 2 receiving from individual 1 the return gift $g_1 = f_1(g_2)$ if he initially gives him the gift g_2.

If the initial giver 1 feels that *the order of the gifts is irrelevant,* then when he receives $g_2 = f_2(g_1)$ as a return gift for his giving g_1, he feels *frustrated* if what he has given, g_1, differs from the return-gift he would have given as a return to $g_2 = f_2(g_1)$, namely, $g_1 = f_1(g_2) = f_1[f_2(g_1)]$.

Therefore, the initial giver 1 feels *not frustrated* by the whole gift/return-gift process only in giving g_1 that is a solution of $g_1 = f_1[f_2(g_1)]$.

If the roles are reversed, and if the giver, individual 2, feels that the order of the gifts is irrelevant, he is similarly not frustrated in choosing $g_2 = f_2[f_1(g_2)]$. But in both cases, the pairs of gifts (g_1, g_2) are the same since they are the solutions of the two equations $g_1 = f_1(g_2)$, $g_2 = f_2(g_1)$.

Hence, *whoever the initial giver is, if he feels that the order of the gifts is irrelevant, his non-frustration gift/return-gift outcomes are the same.*

Such solutions of the pair of return-gift equations $g_1 = f_1(g_2)$, $g_2 = f_2(g_1)$ are naturally called the *reciprocal equilibria.*

The initial giver, individual 1, usually prefers not being frustrated. Yet this is usually not his only preference in this problem since what he loses, g_1, and what he receives, g_2, also generally have some intrinsic value for him. Therefore, his choice is usually not a reciprocal equilibrium. Rather, if he knows individual 2's return-gift function $f_2(g_1)$, he chooses g_1 that yields his preferred pair $\{g_1, g_2 = f_2(g_1)\}$, that is, a choice constrained by individual 2's return-gift reaction schedule $g_2 = f_2(g_1)$. We call this pair of gifts *the solution with individual 1 giver* of the gift/return-gift relation, and we denote it $G^1 = (g_1^1, g_2^1)$. This is generally not an equilibrium. That is, *the initial giver chooses to be frustrated.* He is compensated for that by the utility he derives from g_2 less what he loses in parting with g_1.

Similarly, in permuting the roles, there exists a *solution with individual 2 giver,* denoted $G^2 = (g_1^2, g_2^2)$.

With the usual assimilation between choice and preference, individual 1 does not prefer an equilibrium to G^1 since an equilibrium satisfies $g_2 = f_2(g_1)$, and individual 2 does not prefer an equilibrium to G^2 since an equilibrium satisfies $g_1 = f_1(g_2)$. However, one cannot say in general whether any individual prefers G^1 or G^2, that is, if it is better to be the initial giver or the receiver. Other meaningful relations between solutions and equilibria will appear when we specify the nature of the gifts g_i below.

However, if simple gift/return-gift does not produce a reciprocal equilibrium, longer reciprocity processes usually lead to an outcome of this type, as we show now.

4.2. Reciprocity processes

Yet, these processes can take several forms, such as the important following ones.

a) MYOPIC RECIPROCITIES

For instance, one can have an alternating series of *myopic* gifts, where myopic means that each gift is considered as the return gift of the previous other's gift: if $n = 1,2,...$ are successive dates, $g_{i,n}$ is individual *i's* gift to the other at date n, with $i = 1,2$, and $g_{i,n} = 0$ denotes the absence of a gift from individual i at date n, then an *alternating myopic* reciprocity process is defined by

$$g_{2,n+1} = f_2(g_{1,n}),\ g_{1,n+2} = f_1(g_{2,n+1}) \text{ and } g_{1,n+1} = g_{2,n} = 0, \text{ for } n \text{ odd},$$

and a *simultaneous myopic* reciprocity process is defined by

$$g_{2,n+1} = f_2(g_{1,n}) \text{ and } g_{1,n+1} = f_1(g_{2,n}).$$

A *reciprocal equilibrium* is a pair of gifts (g_1, g_2) that satisfies the two equations $g_1 = f_1(g_2)$ and $g_2 = f_2(g_1)$. If for some $n = \nu$ (possibly $\nu = 1$), either $g_{1,\nu}$, or $g_{2,\nu+1}$ in the alternating case, or $g_{1,\nu}$ and $g_{2,\nu}$ in the simultaneous case, are gifts of a reciprocal equilibrium, the subsequent gifts are those of this reciprocal equilibrium.

If, furthermore, a metric is defined in the sets of the gifts g_1 and g_2 (this is for instance the case if the gifts are quantities of goods, thus defined in R^m_+), then convergence $g_{i,n} \to \bar{g}_i$ is defined. The possible convergence gift-pairs when n increases are the stable reciprocal equilibria.

b) CUMULATIVE RECIPROCITY PROCESSES

In more general cases, in a process of successive alternating or simultaneous reciprocal gifts, each gift depends on more past gifts from both sides. Each gift may be seen by its giver as an adjustment of the pending stock of past gifts, and these stocks are seen as the relevant variable of the reciprocity relation. Denote as $\gamma_{i,n}$, with $i = 1,2$ and $n = 1,2,...$, the gift given by individual i to the other individual at time n, as $\gamma_{i,n} = 0$ the absence of gift from individual i at time n, and as $g_{i,n} = (\gamma_{i,1}, \gamma_{i,2},..., \gamma_{i,n}, 0,0,...)$ the set of the n first $\gamma_{i,\nu}$ completed by zeros for $\nu > n$. The $\gamma_{i,n}$ are the *elementary gifts* and the $g_{i,n}$ are the *cumulated gifts*.

An *alternating cumulative* reciprocity process is defined by

$$g_{2,n+1} = f_2(g_{1,n}),\ g_{1,n+2} = f_1(g_{2,n+1}) \text{ and } \gamma_{1,n+1} = \gamma_{2,n} = 0, \text{ for } n \text{ odd},$$

and a *simultaneous cumulative* reciprocity process is defined by

$$g_{2,n+1} = f_2(g_{1,n}) \text{ and } g_{1,n+1} = f_1(g_{2,n}).$$

We have $g_{i,n+1} = g_{i,n}$ when $\gamma_{i,n+1} = 0$.

We again call a pair of gifts (g_1, g_2) that satisfies the equations $g_2 = f_2(g_1)$, $g_1 = f_1(g_2)$ a *reciprocal equilibrium.*

If for some $n = \nu$ (possibly $\nu = 1$), either $g_{1,\nu}$ or $g_{2,\nu+1}$ in the alternating case, or $g_{1,\nu}$ and $g_{2,\nu}$ in the simultaneous case, are gifts of a reciprocal equilibrium, the subsequent *cumulated gifts* $g_{1,n}$ and $g_{2,n}$ for $n \geqslant \nu$ are those of this reciprocal equilibrium, and $\gamma_{1,n} = \gamma_{2,n} = 0$ for all $n \geqslant \nu$.

If furthermore a metric is defined for the sets of gifts $\gamma_{1,n}$ and $\gamma_{2,n}$, for instance if these gifts are quantities of goods, thus represented in R^m_+, then convergence $\gamma_{i,n} \to 0$ is defined. The possible convergence cumulated-gift pairs when n increases are the stable reciprocal equilibria.

4.3. Other phenomena and modalities of reciprocity

The various gift/return-gift and longer reciprocity processes that we have considered present the interesting characteristic that they can largely be studied with the same analytical apparatus based on the return-gift functions f_1 and f_2. In particular, the analyses of the «quantitative case» in the next section can thus be given several interpretations.

Many other phenomena of the gift and reciprocity relationship can be introduced, and other specific structures of processes can be considered (the study of classical exchanges proceeds similarly). Among the phenomena let us mention the game-theoretic aspect coming from the consideration of unknown gifts from the others, either in simultaneous giving, or in considering the others' future gifts. Another important question is the refusal of a gift or of a return gift, with its many possible reasons, availabilities and consequences[10]. Income effect and time preference can also be considered more explicitly. The processes can be continuous rather than discrete[11]. Also, we have considered reciprocity in time, but another important dimension is risk, since reciprocity is often *entraide* or mutual help of those in difficulty, as a kind of mutual insurance with a certain dimension of altruism or community. Finally, the normative aspect is particularly important. Gift-giving and reciprocity benefit from a favorable image. Yet the comparison of equilibria with Cournot-Nash outcomes and of solutions of gifts/return-gifts with Stackelberg ones suggests that they may not be Pareto-efficient. The next section will consider this question, and the general answer it provides is valid in the more general frameworks.

5. The quantitative case

5.1. The framework

Consider two individuals, 1 and 2. Each initially owns a quantity of a good, say his labor, denoted respectively and correspondingly as good 1 or 2. Each individual may transfer a quantity of his good to the other (like he works for the other, he provides him with services), and he keeps the rest of his good for himself (e.g., self-services, leisure, or working in exchange for a remuneration). x_j^i denotes the quantity of good j of which individual i benefits. We have $x_j^i \geq 0$. The total quantities $x_2^1 + x_2^2 = x_2$ and $x_1^1 + x_1^2 = x_1$ are given. Figure 1 represents the situation in the Edgeworth box *ABCD*. Vectors $x^1 = \{x_1^1, x_2^1\}$ originating from A represent individual 1's consumption. Vectors $x^2 = \{x_1^2, x_2^2\}$ originating from C represent individual 2's consumption. Vectors $\{x_1^1, x_2^2\}$ originating from D represent own consumptions. Vectors $x = \{x_1^2, x_2^1\}$ originating from B represent the transfers. Any of these vectors suffice to represent a point in the Edgeworth box; we choose the vector of transfers x. Hence $x = 0$ denotes an absence of transfers (point B).

[10] Cf. Kolm (1984), ch. 14 and 15.

[11] Cf. Kolm (1984).

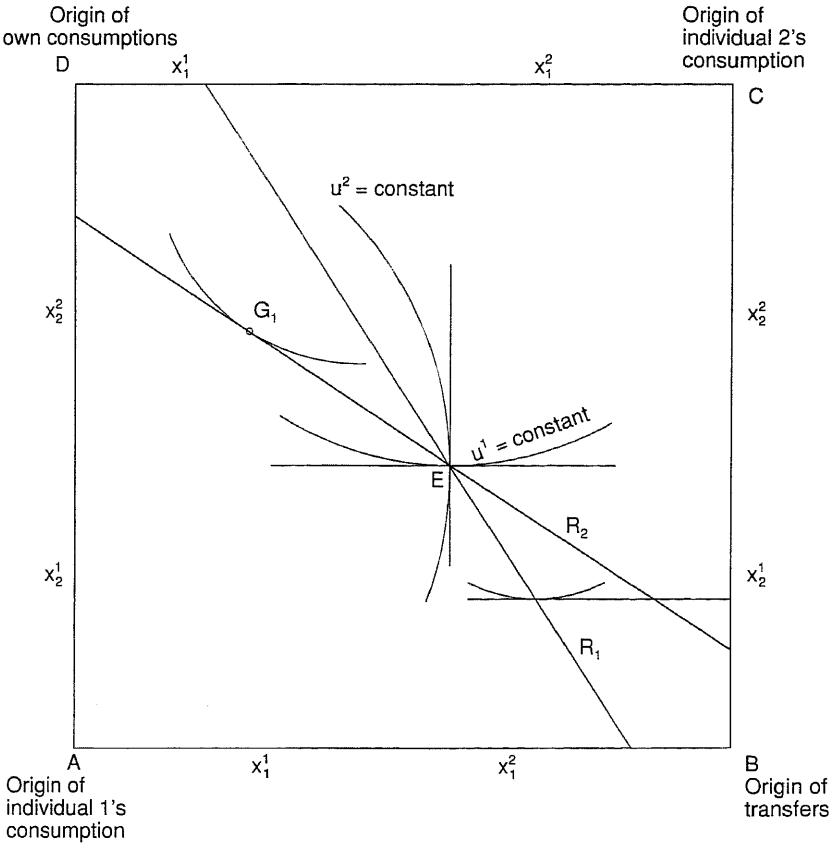

Figure 1

One can apply on these variables the preceding discussions concerning gift, gift/return-gift, reciprocities and the comparison of systems.

The cumulative reciprocity processes will be specified in calling x_j^i the sum of elementary gifts from individual j to individual i before some date[12].

5.2. *Return-gift functions*

Assume individual 2 gives the quantity x_2^1 of his good 2 to individual 1. Then individual 1 reciprocates with the *return gift* x_1^2 of his good 1 to individual 2. The return gift *a priori* depends on the gift, by the *return-gift function* $x_1^2 = f_1(x_2^1)$ where f_1 is a one-valued function, f_1: $[0, x_2] \rightarrow [0, x_1]$.

[12] A beautiful concrete example of such an iterative cumulative reciprocity process is provided by the description of «exchange» of axes for spears between two tribes of the Huon gulf in Marshall Sahlins' *Stone Age Economics*.

If $f_1(0) > 0$, this manifests the desire of a pure gift (for instance because of a sentiment of pure altruism) from individual 1 to individual 2. But there can also be reciprocity behavior without pure giving, for individual 1: then, $f_1(0) = 0$ but $f_1(x_2^1) > 0$ for some $x_2^1 > 0$.

The return-gift function is normally increasing: the larger the gift one receives, the larger the return gift. Of course, a number of psychic phenomena can render this function decreasing. One such case can occur when the initial receiver infers the other's means or needs from the gift («if he gives me so little, he probably has little means or large needs, hence I give him much», «if he gives me so much, he probably has large means or low needs, hence I give him only little»). Another case with this effect can be the reaction «since he gives me so little, I shall give him much in order to make his miserliness conspicuous to himself or to others, say, to humiliate him». And so on. Yet such informational or other effects are extraneous to the pure return-gift phenomenon, and the increasingness (at most non-decreasingness) of the return-gift functions can be considered the normal case.

The function $x_1^2 = f_1(x_2^1)$ can be represented graphically in the Edgeworth box by the *return-gift curve* R_1.

The case where individual 1 is purely self-interested is $f_1 = 0$ whatever x_2^1 and R_1 is the side BC of the Edgeworth box.

The same remarks can be presented in inverting the two indices.

The reciprocity processes described in section 3 can be written with the present variables, the g_1 and g_2 being respectively x_1^2 and x_2^1.

5.3. Reciprocal equilibria

Reciprocal *equilibria* are the solutions of the system $x_1^2 = f_1(x_2^1)$ and $x_2^1 = f_2(x_1^2)$. They are represented by intersections E of the curves R_1 and R_2[13].

Stable reciprocal equilibria are those where $|f_1'. f_2'| < 1$ where f_1' and f_2' are the derivatives of the functions f_1 and f_2 (this is local stability, and an easy discussion can take care of the cases where these derivatives do not exist –or are not unique– and where the product is equal to 1).

The results concerning the existence of reciprocal equilibria are the following (the proofs are rather simple and hence are omitted).

[13] Among the possibilities are equilibria with some $x_j^i = 0$, multiple equilibria, and even the existence of continua of equilibria in domains where the return-gift functions are inverse of each other (i.e., sections of the return-gift curves coincide). This latter case may result from the two individuals following the same social norm of reciprocity that is independent of the orders of the gifts (for instance $x_2^1 = x_1^2$ if the units of the two goods are comparable –e.g., time of labor–, or $x_2^1 = \alpha\, x_1^2$ if one unit of good 1 is deemed to be worth α units of good 2).

PROPOSITION 2. *With non-decreasing return-gift functions, there exists a reciprocal equilibrium, and there even exists a stable reciprocal equilibrium.*

PROPOSITION 3. *With continuous return-gift functions, there exists a reciprocal equilibrium.*

Return-gift functions are continuous if reciprocity preferences bearing on allocations –discussed below– are strictly convex (a utility index is strictly quasi-concave).

When neither continuity (Proposition 3) nor monotonicity (Proposition 2) holds, one return-gift curve can pass through a «hole» in continuity of the other, or two holes in them may meet, as shown in Figures 2 and 3.

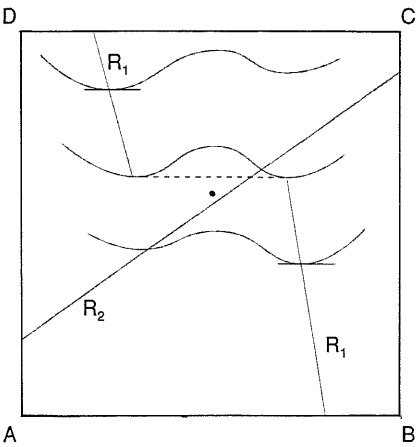

Figure 2

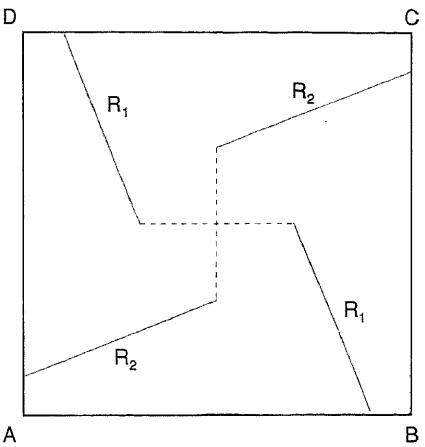

Figure 3

5.4. Preferences and solutions

The individuals may have preferences on outcomes represented by points in the Edgeworth box for a series of reasons. Individual 1 may appreciate his own consumption x^1, he may have preferences on the other's consumption x^2 for any reason (benevolence, justice, etc.), he may have preferences comparing x^1 and x^2 for any reason (envy, comparative justice, etc.), he may also have preferences on the transfers themselves x_1^2 and x_2^1 for their various properties of relation and attitude, or he may have preferences on their comparison for reasons of equity or of sentiments or norms of reciprocity, and this may depend on x^1 and x^2. We aggregate all the reasons for preferences among points in the Edgeworth box into one single preference that we describe as a preference on x.

The return-gift function f_1 is defined by the fact that x_1^2 is the coordinate of the x that individual 1 prefers –hence (by assumption) chooses– under

the constraint that x_2^1 is given. Similarly, the solution G_1 of the gift/return-gift with individual 1 giver is the x that individual 1 prefers under the constraint that $x_2^1 = f_2(x_1^2)$, and that he achieves in choosing the corresponding x_1^2.

If individual 1's preferences are representable by an ordinal utility index $u^1(x)$ with indifference curves $u^1(x) =$ constant, in each point of R_1 individual 1's indifference curve has a tangent at $x_2^1 =$ constant, and in G_1 individual 1's indifference curve is tangent to the curve R_2.

The same remarks hold for individual 2 in permuting the indices.

5.5. Comparison of the gifts of equilibria and solutions

We say that an individual *appreciates the others' gift* when he would not prefer to receive less –given that he himself also gives what he wants to give[14]. This is the most normal and ordinary case, and it is necessarily the case if the individual accepts the gift when he could refuse any part of it (see section 7 below).

Comparing solutions and equilibria gives the following properties.

PROPOSITION 4. *In a solution, the (initial) giver receives at least as much as in an equilibrium where he appreciates the other's gift; he receives more in the general case where he prefers this solution to this equilibrium.*

Proof. Denote as $x_2^1(x)$ the value of x_2^1 at x, and $\succ_1$ and $\succsim_1$ preference and indifference of individual 1. Then, from the definition of E, $E \in R_1$ and $E \in R_2$; from the definition of R_1 and individual 1's appreciation of the other's gift,

$$x \succsim_1 E \Rightarrow x_2^1(x) \geqslant x_2^1(E)$$

and

$$x \succ_1 E \Rightarrow x_2^1(x) > x_2^1(E);$$

from the definition of G_1

$$x \in R_2 \Rightarrow G_1 \succsim_1 x,$$

from which $G_1 \succsim_1 E$. Therefore, $x_2^1(G_1) \geqslant x_2^1(E)$, and $x_2^1(G_1) > x_2^1(E)$ if $G_1 \succ_1 E$.

[14] He «gives what he wants to give» implies that either the other accepts this gift, or the individual cares only for his supply of gift (the question of refusal of gift is noted in Section 7 and not analyzed in detail in the present study).

PROPOSITION 5. *The gifts are at least as large in a solution as in an equilibrium if the giver appreciates the other's gift at the equilibrium and if the return-gift function of the receiver is non-decreasing; they are larger in the general case where the giver prefers this solution to the equilibrium.*

Proof. If individual 2's return-gift function is non-decreasing, $x_2^1(G_1) \geqslant x_2^1(E)$ implies $x_1^2(G_1) \geqslant x_1^2(E)$. Hence Proposition 4 implies the first part of Proposition 5.

Furthermore, $G_1 \succ_1 E$ implies $x_2^1(G_1) > x_2^1(E)$ from Proposition 4. It also implies $G_1 \neq E$. Therefore $x_1^2(G_1) = x_1^2(E)$ is impossible since $G_1 \in R_2$ and $E \in R_2$ and the curve R_2 represents a (one-to-one) function. Hence the second part of Proposition 5.

Hence, a gift/return-gift solution normally involves more gifts than is required by non-frustration equilibria, or than is achieved by an equilibrium reciprocity process.

PROPOSITION 6. *The giver prefers any solution to any equilibrium that is not a solution.*

PROPOSITION 7. *The receiver prefers any solution to any equilibrium if his return-gift function is increasing and if he appreciates the other's gift.*

PROPOSITION 8. *Both agents prefer any solution to any equilibrium in the «normal» case where their return-gift functions are increasing and they appreciate the other's gift.*

Proofs. Proposition 6 results from both equilibria and solutions being on the receiver's return-gift curve, and from the definition of a solution. Proposition 7 results from Proposition 4. Proposition 8 results from Proposition 7.

5.6. Inefficiency?

Yet, what is important from the normative point of view is optimality, and to begin with Pareto-efficiency. Now the individuals' indifference curves, when they exist and are smooth, intersect at a right angle at equilibria, and are not tangent to each other at solutions. Therefore, for each of these states, there seem to exist other *x's* that are preferred by both individuals. That is, gift/return-gift and, more generally, reciprocities seem to be inefficient and hence non-optimal processes and systems.

However, *achieving other x's requires another mode or system than reciprocity (and in particular gift/return-gift).* For instance, the two individuals could bargain, or the state *x* could be imposed by an authority (for instance the State). Yet, with system preferences, the individual preferences on *x* alone would *a priori* not be what they are with a reciprocity relationship. In particular, the *x's* that would be efficient with reciprocity preferences are *a priori* not the same ones as the efficient *x's* with a realization by pure exchange or by force (althought there

may be x's that are efficient in two systems, namely the intersections of the two corresponding contract curves).

Indeed, more generally, the following proposition shows that it is practically impossible that an individual's allocative preferences (his preference ordering of the x) are the same with two different systems if there are system preferences.

PROPOSITION 9. *An individual's allocative preferences cannot be the same with two systems such that, for this individual, 1) one system is preferred per se to the other, 2) these systems are related by the condition of effective transfers, 3) for one system (at least), one allocation with transfers is equivalent to the allocation without transfers (a condition that is generally satisfied).*

Proof. The identity of allocative preferences for the two systems s and s' is

$$(s, x) \succsim (s, x') \Leftrightarrow (s', x) \succsim (s', x')$$

for all x, x' that satisfy one of these relations. Assume it holds. Consider a particular x with transfers (in general in both directions), $\xi \neq 0$, such that $(s, \xi) \sim (s, 0)$ and therefore also $(s', \xi) \sim (s', 0)$. If system s is preferred *per se* to system s', by definition $(s, \xi) \succ (s', \xi)$. But from the *condition of effective transfers*, $(s, 0) \sim (s', 0)$. Hence a contradiction.

More generally, given the identity of allocative preferences, the proof of impossibility requires only that there exists one $\xi \neq 0$ that satisfies both $(s, \xi) \sim (s, 0)$ and $(s, \xi) \nsim (s', \xi)$ (where $\nsim$ means not $\sim$, i.e. either $\succ$ or $\prec$). This is more general than preference *per se* between systems s and s'.

The existence of a ξ such that $0 \neq \xi \sim 0$ for a given s is very general. This is satisfied if less of one's own good can be compensated by more of the other's good, in any ratio, for at least one pair of transfers, from the non-transfers allocation[15].

In particular, with purely self-interested exchange or with force, the x_j^i's with $i \neq j$ cannot be called *gifts* in any normal sense of the term. Indeed, the concept of a gift implies voluntariness and *a priori* gratuitousness. A *gift* is by definition a transfer that is free in two senses of the term, one for

[15] When the preference orderings are represented by utility functions, the identity of allocative preferences for different systems s means that the utility function has the structure $u(x,s) \equiv U[v(x),s]$ where u, U and v are real numbers and U is an increasing function of v, for these s's. This is the form that is excluded by the general indicated conditions. If we wanted a more specific structure of preferences and utility functions, then the conditions for impossibility are still more general. In particular, *system preferences and the condition of effective transfers preclude that one has a utility function with an additive cardinal specification,* i.e. of the form $u(x,s) \equiv F[v(x) + w(s)]$ with a monotonic (or increasing) function F. Indeed, system preferences imply that there exists a triplet (x,s,s') such that $u(x,s) \neq u(x,s')$, hence $w(s) \neq w(s')$, but this implies $u(0,s) \neq u(0,s')$, i.e., it violates the condition of effective transfers.

each of the individuals: it is a free act of the giver, and it is free for the receiver in the sense that it is *not conditional* on a payment of any sort from the receiver. Of course, the receiver may voluntarily choose to offer a return gift, but he is free to do it, this is not a condition of the initial gift. Or the gift may be the return gift of a previous gift, yet to provide it was not a condition of the initial gift and it is not a contractual obligation. In other words, and external obligation to transfer implies that the transfer is not a gift. And the expression «I give you this if you give me that» implies that the transfers are not gifts, but, rather, the two elements of an exchange. A *gift* is neither conditional nor a condition.

Hence, an explicit agreement cannot be a reciprocity (a set of at least two gifts, one in each sense). Can an implicit agreement be one? This is an important question since, if the answer is positive, a sequence of gifts in both directions might produce a sequence of *x's* that is globally efficient (for instance a repeated «two-ways gifts» game might produce an efficient *x* at each elementary game). This may require any solution of the backward induction problem (as noted above). However, what matters to the quality and the intrinsic evaluation of the process is the attitudes and sentiments, and they are not likely to be fundamentally affected by the fact that the agreement is explicit or implicit. To abide by a «cooperative» behavior only because of the threat of retaliation, is not better than haggling and bargaining with brandishment of these threats.

Therefore, since affects and specific preferences are attached to gifts and gift-giving, the preferences on *x* are unlikely to be the same in reciprocity as in the other systems. The «allocation preferences» may well be the same, but the «transfers preferences» are unlikely to be the same, with different *s*, and by definition the overall («allocative») preferences on *x* encompass both.

6. Reciprocity and other systems

6.1. Intrinsic values of economic systems

Comparing the intrinsic values (i.e., for given *x*) of systems or modes of realization can lead one to long and elaborate discussions[16].

Exchange and reciprocity both differ from force because they respect freedom –indeed, they both rest on it–, and freedom is often desired *per se* (Tocqueville proposes that anyone who wants freedom for another reason –i.e., as a means to something else– does not deserve it and will soon lose it)[17]. On the other hand, freedom is sometimes disliked because of the costs and «anguish» of choice. The responsibility it entails is sometimes appreciated and sometimes not.

[16] This is one of the main topics of the book Kolm (1984).

[17] The economics of the value of freedom *per se* is carried on in Kolm (1982).

Market exchanges have well-studied properties of economic efficiency. Local, traditional markets are also often the place of valuable and important social interactions. Furthermore, the market is often a liberation from planning or even an individual liberation from the relations of closely-knit societies. Yet, the mental and social drawbacks of many market settings have also been abundantly studied: market exchanges rest on egoism and greed and they reward them and thus reinforce them; large markets produce anomie, estrangement, anonymity, alienation; competition is hostility, often aggressiveness; lying and cheating are so little against the spirit of the market that when they are banned, this is by public regulation (and when they are limited for the sake of future relations, the motivation is again egoistic rather than moral); even «perfect» markets can produce distributions driving a number of people to famine or producing widespread «exploitation»; the mercantile human type is hardly considered a beautiful one; etc.

Gifts and reciprocities differ markedly from the other modes although, we have seen, there is a large array of varieties and even a continuum of intermediary cases with exchange. The main difference is that, mostly, gifts and reciprocities manifest and support positive and universally appreciated sentiments and attitudes of altruism, «fellow-feeling», help, solidarity, community, selflessness, friendship, liking or «love», brotherhood, and so on. «Friends make gifts and gifts make friends». To point out the exceptions consisting in negative gifts or negative aspects of gifts is a banality. Everyone knows cases of gifts given in order to extract a return gift, of gifts made in order to manifest a superiority or –on the contrary– a subjection, of gift-giving imposed by heavy social norms supported by guilt or by social pressure, of conspicuous giving motivated by egoistic «image-building», of often disagreeable sentiments of indebtedness resulting from having received a gift and of return gifts motivated by the desire to get rid of this sentiment, etc. Yet, what normatively matters is the existence, hence the possibility, of other, positive types of gift-giving and reciprocities, with at least some degree of concern for others.

People may switch from one mode of realization to another. For instance, goods that were given and received in a reciprocitarian framework become sold and bought, whatever the specific reasons, mechanisms and processes of this change. In particular, modern economic history is a vast replacement of reciprocities by exchange or planning. This «Great Transformation» (Polanyi) is the essence of the «development» of societies. Two questions that concern us here can be considered in this respect.

The first question is the quantitative transformation of transfers that accompany their qualitative transformation. Let us just note presently that the answer depends on the measurement and on the case. In particular, the proportion of labor-time and of consumption that is transferred sometimes increases and sometimes decreases –more on this below.

The second question is the normative judgment on this process and on its variants. It is a (or the) major issue of our time. To merely compare the

amounts or money value of goods that are bought misses two crucial elements. First, many goods can be, not sold and bought but, rather, either directly consumed or transferred by reciprocity. Second, the social relations that accompany certain transfers may be valuable and appreciated –or on the contrary repulsive– *per se*. Now, a basic argument in this respect is that the process should probably be considered as good if the people who engage in it do it freely and voluntarily. Past and present history show a vast array of cases. Force is often used in various ways: it is direct in forced labor, more indirect in taxation that forces one to produce «cash-crops» (and is sometimes imposed with this specific purpose assumed to be good for «development»), and not absent when the change is induced by destruction of natural traditional environment. Yet, the market is often freely chosen over reciprocities, although there are widespread complaints concerning the loss of interpersonal relationships, of positive sentiments toward others and of sense of community that accompany reciprocities. Therefore, presumably, the purely economic efficiency of the market system makes for the loss of the relational advantages of reciprocity.

This shift is often accompanied by an increase in transfers and in the share of labor and of consumption that is provided to others or received from them (and correspondingly in the division of labor). However, if transfers carry desired social relations, they should be valued for this also, and this should be a reason to make more of them; or, if they lose this social value and are reduced to their pure economic value, they are on the whole less valuable and this is a reason for making less of them. One tends to supply more labor if one enjoys labor relations than otherwise. Hence, there is an apparent paradox. Now, the results obtained above can provide the following explanation for it.

6.2. The autarky of reciprocity

We associate now the results concerning the comparison of economic systems, of Section 3, with the results concerning reciprocity, of Section 5. Consider a «good» reciprocity system that is preferred *per se* to another system, for instance an exchange (in particular a market) or a planned (coercive) system. Consider also the above framework of two individuals 1 and 2 each transferring of his good (e.g., labor) to the other. The preference *per se* is for both individuals. The following results hold.

PROPOSITION 10. *A gift received by an individual who appreciates it and can give in return is smaller than what this individual receives in an allocation by exchange or by force that he likes better or as much.*

PROPOSITION 11. *In a gift/return-gift solution where the gift is appreciated, the giver gives less than he transfers in an allocation by exchange or by force that the receiver likes better or as much.*

PROPOSITION 12. *Each transfer of a reciprocal equilibrium where each individual appreciates the other's gift, is smaller than the corresponding transfer in an allocation by exchange or by force that both individuals like better or as much.*

Proofs. Propositions 11 and 12 are applications of Proposition 10 to, respectively, a gift/return-gift solution and the (initial) receiver, and a reciprocal equilibrium and both individuals. Proposition 10 results from the following.

Denote as r the reciprocity (including gift/return-gift) system that is preferred *per se* to another system, denoted s, that can be an exchange or a coercive system. By hypothesis,

$$(r,x) \succ_i (s,x) \text{ for all } x \neq 0 \text{ and } i = 1,2. \qquad [3]$$

Consider now $x \in R_1$ where individual 1 appreciates the gift he receives x_2^1. Then, $x_2^{1''} > x_2^1$ for all x'' such that $(r,x'') \succ_1 (r,x)$.

Consider furthermore an x' such that $(s,x') \succsim_1 (r,x)$ Then, applying [3] to x' and $i = 1$, we have

$$(r,x') \succ_1 (s,x') \succ_1 (r,x),$$

hence $(r,x') \succ_1 (r,x)$ and therefore $x_2^{1'} > x_2^1$.

Q.E.D.

Proposition 12 indicates that a reciprocal equilibrium is more *autarkic* than an exchange or forced allocation that everyone prefers. If this preference induces the system to pass from reciprocity to exchange (in particular markets) or to «planning», then the transfers –and the corresponding division of labor– increase (in line with much of historical experience).

6.3. System illusion and endogenous preferences

However, in a number of cases the proportion of labor-time or of consumption goods that is transferred was larger in the previous reciprocal equilibrium than it is in the new system, and they are cases with obvious intrinsic social value and intrinsic appreciation of the reciprocity mode of transfers[18]. Then, from the previous results, the transformation cannot be voluntary, it must have been imposed by force. Yet, when the new system is the market, by definition it is not directly imposed by force. And indeed, in a number of such cases the change seems to be voluntary. This is the *paradox of free shrinking.*

The answer and explanation commonly appears to be *system illusion.* That is, when they are in a system people do not foresee correctly all the

[18] As an extreme example, an Australian aboriginal hunter gives away all the parts of the game he has killed. This, of course, is for the relational value of the transfer.

relevant aspects and effects of the other system: they may foresee mistakenly the transfers, or –more easily– the relational differences between the modes and what it feels like to be in a system, or, still more easily, the person that they will themselves be in this other system. This latter effect is particularly pernicious and widespread. Indeed, an economic-social system molds preferences, values, tastes, outlooks, world-views. Now, first, it is particularly difficult to foresee how it feels to become in a sense a more or less different person and how one would then appraise the world (transfers, relations, etc.). Second, this effect may create an irreversibility: even if there is a meaning in saying that one is globally less well off in a system –including because of what one is– this effect may prevent correcting an erroneous change and may block individuals and societies in systems that are not the best, although all is perfectly free and voluntary.

Indeed, denote as $U_s(s')$ the (ordinal) utility function of a representative individual in system s when he compares possible systems s' for all reasons taken together. System s', seen from system s, may be preferred to system s: $U_s(s') > U_s(s)$. Yet, when people live in system s', they acquire a new system of preferences, $U_{s'}$, and it may be that $U_{s'}(s) > U_{s'}(s')$, that is, in each system people prefer to be in the other. Even if this is not the case and $U_{s'}(s') > U_{s'}(s)$ so that system s' is «stable» and people prefer it to the system s both if they see it from system s and if they see it from system s', this does not imply that it makes people happier. Indeed assume that these preferences are comparable; we manifest this by rewriting $U_s(s')$ as $U(s,s')$. Then we can have $U(s',s') < U(s,s)$ even though $U(s,s') > U(s,s)$ and $U(s',s') > U(s',s)$ (or, indeed, $U(s',s) > U(s',s')$. If the utility functions of the preceding paragraphs are such that the system argument s represents both arguments of $U(s,s)$, this explains the noted paradox. The only way out would be that people foresee and appraise their own changes of preferences. Such wisdom sometimes exists in exceptional persons, but it is certainly not widespread.

7. Gift refusal

A gift, of a return-gift, may sometimes not be accepted, in totality or in part. The possible reasons for such a refusal are numerous. Then, a gift variable is decomposed into two variables, the offered gift, and the lower accepted gift. This may create discontinuities in the various return-gift functions. We do not develop this question here; the interested reader can find an analysis of its psycho-social, economic and logical aspects in Kolm, 1984 (pp. 410-11 and 436-37).

8. Conclusion

Economic systems matter not only for the goods they deliver. They are major parts of societies and differ with respect to freedom, relations of individuals to others and to groups, and even to what men are (systems make men

no less than men make systems). All this affects utilities, happiness and other values. Furthermore, although markets, and to a lesser degree planning, are extensively studied, this is not the case for other modes of economic realization, notably of reciprocity (although the extreme case of gift-giving has given rise to a small literature). We proposed an analytical framework and first results in the economic analysis of reciprocity and of the choice of economic systems. This study relates preferences among systems *per se* and for their economic performance. It presents the main types of reciprocity and the definitions and possible meanings of the basic concepts of reciprocity analysis: return-gift functions, solutions and equilibria. In the quantitative case, it notes conditions for the existence of reciprocity equilibria, it compares the transfers and preferences in solutions and in equilibria, and it compares the transfers in reciprocity with those that occur in exchange or planning systems that are preferred (thus proposing an explanation of the «paradox» of the «autarky of reciprocity»). The contrary paradox of «shrinking free transfers» is explained by «system illusion». In particular, endogenous preferences may spoil free, voluntary choice of systems of its normative significance.

Appendix: Altruistic efficiency from egoistic behavior

Let us follow Pareto (1913) in assuming that each individual i with consumption bundle x^i is endowed with both an *ophelimity* function $v^i(x^i)$ that represents his individualistic, self-interested welfare, and a *utility* function $u^i[\{v^j(x^j)\}]$ where u^i is a non-decreasing function of the v^j for all j and an increasing function of v^i –that is, a Pareto utility is a Bergson's Social Welfare Function. When u^i is an increasing function of v^j for $j \neq i$, this describes individual i's altruism toward individual j. This altruism «respects individual j's preferences», or individual i is «non-paternalistic» toward individual j because u^i depends on x^j only through the intermediary of v^j. Pareto takes for the u^i the particular form of linear functions of the v^j (this can result from a property of «separability»)– we do not need this specification here.

If the x^j change so that no v^j decreases and at least one increases, then no u^i decreases and at least one increases. Therefore, if such a transformation of the u^i is impossible, this implies that such a transformation of the v^j is impossible. That is, Pareto-efficiency with the u^i implies Pareto-efficiency with the v^j: *«utility Pareto-efficiency»* implies *«ophelimity Pareto-efficiency»*. Therefore, from the classical «second theorem of welfare economics» applied to «ophelimity Pareto-efficiency», with the required quasi-concavities of the v^j and convexity of the possibility set, Pareto-efficiency (i.e., «utility Pareto-efficiency») can be obtained, with the required initial distribution, by the actions of the individuals that maximize their self-interested ophelimities on a competitive market. Therefore, «altruistic individuals can obtain Pareto-efficiency in behaving egoistically». This is about the results of Winter (1969) and of Archibald and Donaldson (1976). This result, however, raises three categories of problems, concerning respectively: the structure of preferences, individuals' motivations and behavior, and a «planner's» information and

distributional possibilities (in addition to the classical questions of convexity and quasi-concavity).

1) The Paretian structure of utilities is not obvious. In the form $u^i[\{v^j(x^j)\}]$, what is exactly the meaning of the ophelimity (or «individual welfare») functions v^j? The best defense of this structure is the following (Kolm, 1964, 1966).

A priori, the individual utilities are of the general form $U^i(\{x^j\})$. U^i depends on x^j for $j \neq i$ for reasons of altruism or benevolence. The first assumption we introduce now is that each individual is happier (or indifferent) when any other is happier *whathever the reason for the happiness of the latter*. This is an assumption of *respect of others' preferences*, or general «non-paternalism». Then the utility functions (and their levels) are $\bar{U}^i = \bar{U}^i(x^i, \{\bar{U}^j\}_{j \neq i})$. The second assumption is that, for each i, the ordering of x^i by this latter function for given levels of the others' utilities $\bar{U}^j$ for $j \neq i$ does not depend on these levels $\bar{U}^j$. This is an assumption of *separability*, for each individual, between his altruism and his tastes on what he consumes. Then the above function can also be written as $\bar{U}^i = V^i[v^i(x^i), \{\bar{U}^j\}_{j \neq i}]$. We now solve these n equations with n unknowns $\bar{U}^i$ for these variables (n is the number of individuals), in assuming that this is defined. We then obtain $\bar{U}^i = u^i[\{v^j(x^j)\}]$ with certain functions u^i. This is the required structure. This structure therefore basically results from: a) the «non-paternalism» assumption and b) the «separability» assumption.

2) «Ophelimity Pareto-efficiency» does not imply «utility Pareto-efficiency» –the actual one. Hence, competitive equilibrium with ophelimity maximizers does not guarantee (utility) Pareto-efficiency. It guarantees this efficiency only with specific initial distributions. Hence, a «planner» who would like to guarantee this Pareto-efficiency must know these distributions and be able to implement them. This information requires that of the result of the competitive equilibrum –and in particular that of the individuals' preferences. Then, the informational advantage of «decentralization» by competitive equilibrium is lost, and one can as well directly allocate final consumption goods. Of course, if this «planner» only wants (utility) Pareto-efficiency, he may need less information than if he wants a specific outcome among these states. But this may still be a large amount of information (perhaps an unreachable one), and, indeed, why would not such a «planner» prefer a specific efficient outcome?

3) The individuals want to maximize their utilities (by assumption). They do not want Pareto-efficiency *per se* –they are not indifferent among all Pareto-efficient states. The actions of individual i aim at maximizing u^i, not v^i. When he exchanges on markets for obtaining x^i, this affects x^j for $j \neq i$, hence in particular v^j, and therefore possibly u^i by this effect. In particular, the individuals will have altruistic actions, by gifts, or by demanding lower prices and offering higher prices on markets. This generally disturbs the competitive mechanism. Individuals' consumptions are externalities and public goods.

What can work is the dichotomy between intra-family altruism and self-interested market behavior (cf. Wicksteed's «non-tuism», 1933, Becker, 1981, Steedman, 1989).

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Resumen

Este artículo 1) analiza las preferencias entre modos (o sistemas) de realización económica, 2) presenta la teoría de la reciprocidad y 3) aplica los resultados obtenidos a la elección entre reciprocidad y otros sistemas (de mercado o de planificación). Los modos o sistemas importan tanto por su rendimiento estrictamente económico como por sus cualidades relativas a la libertad, las relaciones, las actitudes y la naturaleza de la sociedad y del hombre. La reciprocidad es un tipo de transferencia bidireccional entre el obsequio y el intercambio. Las funciones de respuesta al obsequio, los equilibrios y las soluciones son los conceptos básicos del análisis de reciprocidad. Desplazamientos voluntarios de reciprocidades a intercambios de mercado caracterizan la modernización o el desarrollo, con la paradoja de la «autarquía de la reciprocidad», por la cual la pérdida de calidad intrínseca de las transferencias económicas se ve acompañada de transferencias mayores. Las violaciones de esta propiedad se pueden explicar por otros fenómenos (información o preferencias endógenas).

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