On the Viability of Gift Exchange in a Market Environment*

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Abstract

Is gift-exchange inevitably to be crowded out by impersonal market exchange? The presence of a thick-market externality indicates that this is indeed likely to be the case. But reciprocity or gift-exchange induces social relations. The utility function is extended in order to take account of social relations in the form of symbolic utility or moral sentiments. As long as moral sentiments are valued high enough it is shown that both market and gift-exchange can coexist. The spontaneous order need not necessarily select the most efficient market size however.

Keywords: exchange, reciprocity, gifts, moral and extended preferences.

JEL Classification: A13, D51, D62, E11, L17.

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> Nous nous quittâmes enfin très contents les uns des autres, et cet après-midi fut un de ceux de ma vie dont je me rappelle le souvenir avec le plus de satisfaction. La fête au reste ne fut pas ruineuse, pour trente sous qu'il m'en coûta tout au plus, il y eut pour plus de cent écus de contentement. Tant il est vrai que le vrai plaisir ne se mesure pas sur la dépense et que la joie est plus amie des liards que des louis. (J.J. Rousseau - *Les rêveries du promeneur solitaire*, 1782)[1]

1 Introduction

Reciprocal exchange in its pure form can be observed in special places where the market is not strong enough to break personal connections. There are fascinating stories by anthropologists showing how reciprocal exchange arrangements vanish when tribes encounter markets. In an interesting paper Kranton [16] shows that in order to become beneficial, markets need enough participants to reduce search costs. Therefore, reciprocal exchange may survive if initially the proportion of the people that engage in market exchange is not too large. There are other determinants which may tip over the balance in favor of market exchange, such as a lack of trust. In reciprocal exchange people have to trust each other, because production and consumption are separated over time. Moreover, reciprocal exchange may involve a less elaborate division of labor.

Kranton [16] borrows evidence documented by Yellen [20] that describes how the !Kung tribe abandoned reciprocal exchange once they encountered the market economy of Botswana. But reciprocal exchange is not limited to "savage-like" communities nor to some corners of the economy but is an element of importance in developed market economies as well. Reciprocity or gift exchange is an essential aspect of culture. There is a moral dimension to economics so to say, as stressed by Etzioni [10]. Even Adam Smith already knew that "moral sentiments" are important, something also recognized by Kenneth Arrow : "ethical behavior can be regarded as a socially desirable

[1] Eventually we separated very pleased, and that afternoon was one out of my life that I remember with most satisfaction. The party turned out not to be ruinous, for the thirty penny that it cost me at most, one had satisfaction for more than hundred thalers. So it is true that genuine pleasure cannot be measured by its expenses and that a crown gives more happines than a gold coin. (Our translation.)

institution which facilitates the achievement of economic efficiency in a broad sense" (Arrow [2], p. 354). People have a sense of belonging to society at large, inducing cooperative behavior in different guises. Self-interest seeking behavior is a *sine qua non* for coordination in the economy, but there are limits to opportunistic behavior. People want to be respected by others. To a certain extent respect follows from success in the accumulation of wealth, but there are limits to respect-fullness in this sense. Mutual aid and sympathy are important values of their own. For this reason producers may take pride in the quality of the product they deliver, workers may be motivated to do a good job and people in general may take account of each other's interests in different situations. Experiments in economic settings indeed confirm that people may behave different from what standard neo-classical economics predicts. Take for instance, Gächter and Fehr [14] who find that social approval and social familiarity generate a significant rise in cooperative behavior.

Economists have not yet settled the way in which the moral dimension can be handled. At one extreme, the moral dimension is seen as belonging to a value domain that is *incommensurable* with traditional economic activities (e.g. Etzioni [10]; Van Staveren [19]). There is no role for reciprocity to play here since people act according to their conviction, not as a strategic act to evoke similar behaviour of others. At the other extreme, moral values are interpreted as preferences to be handled in the same way as all other preferences (e.g. Becker [6]). If people make certain choices it is because that set of choices maximizes their utility.

In this paper we take sides. First, we think that moral behavior and gift exchange contain an important element of reciprocity. People stick to such behavior because others do so, and because one is treated by the others in the same way as they do. Second, we argue that there is more than that because people have moral preferences, thus attaching value to the way in which society is organised. Therefore, moral values can be traded-off against other values in terms of some notion of generalized utility. In the same vein Frey [12] notes that intrinsic motivation can be crowded out by introducing monetary incentives.[2]

The role of moral preferences is discussed also in Khalil [15]. The author

[2] Arrow [3] points out that the "typical examples designed to show the absurdity or immorality of assigning a money value to activities are based on *finite* changes" (p. 759, emphasize added). He argues further that it is not a characteristic of utility functions that everything has a price, at least not of utility functions that are bounded.

distinguishes substantive and symbolic utility. Substantive utility relates to material tastes in the normal sense, whereas symbolic utility stands for tastes which affirm selfhood like self-integrity and self-respect[3]. Khalil maintains that both types of utility are commensurable but makes no attempt at formalizing this idea. In the remaining of this paper we adopt Khalil's terminology, thus stressing the relevance of different dimensions in utility. People take measure if they decide to abandon moral behavior in favor of pure self-seeking behavior. Crowding-out presupposes commensurability. This holds true for the analysis of Frey as well as in a more general approach to the problem of motivation.

Casual observation shows that people -at least in Europe- are concerned about a loss of morality in recent time. This is often associated with commodification, meaning that markets are expanding into almost every territory of human life. In our terminology this means that the market system crowds out reciprocal exchange, bringing about a lack of close personal relationships. The questions to be answered are then the following. What are the main factors causing such a crowding-out? Is reciprocal exchange in the sense of moral behavior completely wiped out or are there conditions such that both regimes can coexist in equilibrium? To answer these questions we apply the analytical framework based on Kranton [16] and Diamond [8] in a modified way and with a different interpretation. In the model used people can make a deliberate choice between two regimes. In reciprocal exchange agents value moral behavior as they have a sense of belonging to society at large. They produce goods from which they derive substantive utility, but sticking to the moral codes of the group provides also satisfaction in the form of symbolic utility. Initially we assume that the terms of trade between substantive and symbolic utility are deteriorating over time. Extending the model later on, it will be argued that the terms of trade typically depend in a non-linear way on the fraction of agents engaged in reciprocal exchange. More specifically, we assume that people value the market system relatively high if the number of participants is relatively low but gradually change their mind as the market comes to dominate the scene.

In the regime of market exchange agents behave as prescribed in neoclassical theory. If the fraction of agents engaged in pure market activities rises, the market operates more efficiently. People are then less hampered by

[3]Compare the so called 'framing effects' and 'intrinsic versus extrinsic motivations', related terms that are borrowed from social psychology (see Bowles, [7]).

tradition and can seize every opportunity for making a profit. The division of labor can be exploited more fully. The set of goods produced generally differs from that in case of reciprocal exchange. This has an impact on substantive utility. The idea that market efficiency is related to the number of people in the market is characteristic for search models. We generalize this idea by assuming that more encounters between people induce more production by leveling organizational and institutional restrictions. However, both ideas can be modelled in the same manner.

The model applied here differs in a number of aspects from that in Kranton [16]. First, in modelling the search externality we follow the original set-up of Diamond [8],[9] more closely. Second, to simplify further we assume that goods are produced at constant cost instead of introducing a distribution from which agents draw randomly. Finally, it should be observed that we not only obtain corner solutions as in Kranton. Assuming that the terms of trade between regimes depend on the fraction of agents engaged in the market system we find interior solutions with agents operating under different regimes.

The rest of the paper is organized as follows. In section 2.1 we first specify what is meant by sympathy and substantive utility. This sets the stage for modelling reciprocal exchange in section 2.2. Market exchange is discussed in section 2.3. In section 3 we consider equilibrium solutions under different assumptions with respect to the shape of symbolic utility. Complete commodification obtains in section 3.1. Interior solutions with partial commodification are considered in section 3.2. The role of discounting is scrutinized in section 3.3. Welfare considerations are taken up in section 4. The paper closes with concluding remarks in section 5. Proofs of propositions are deferred to the appendix.

2 Exchange Mechanisms

In this section we describe the formal model. The general setup is one in which each agents starts in a situation in which he is involved in a personal relationship with one other agent. A key feature of such a reciprocal exchange relationship is the element of trust. Production and consumption are typically separated over time. Contrary to the market where money serves as a medium of exchange, no such security exists in a reciprocal relationship. It is therefore possible that agents who did produce last period see their rela-

tionship end without having the possibility of consuming in return. Although this favors the existence of markets, market exchange has disadvantages of its own. The market is typically characterized by anonymous agents, without relation-specific commitments, and search costs have to be made in order to find a trading partner. On the other hand is it generally acknowledged that the market is capable of supplying a larger array of goods.

Before turning to a detailed exposition we present an outline in Figure 1. This facilitates the reading of the subsequent sections. The arrows denote possible flows. Agents start in a reciprocal exchange relationship. They can end their relationship and enter the market as unemployed. The distribution of agents in each period is given by the fractions r, u, and m that correspond to the different states as in the figure. The market is characterized by a search process that describes how agents become employed with a good, sell that good and become unemployed again. This search process is determined by the technical parameters a and b to be explained later on.

We start with an exposition of reciprocal exchange and postpone a treatment of the market part to the next section. First however, we discuss the agents' preferences in more detail.

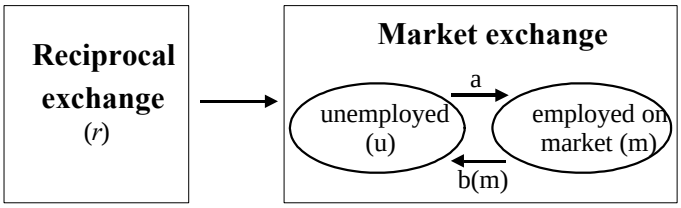

Figure 1

2.1 Substantive and Symbolic Utility

Following Khalil [15] we distinguish between *substantive* utility (ordinary tastes for material goods) and *symbolic* utility (tastes for selfhood and alike).

Consumers derive substantive utility from a basket of goods, which may differ across regimes. Substantive utility for each representative consumer is denoted by x_i, where the index $i = r, m$ denotes reciprocal or market exchange. Symbolic utility can be taken into account by introducing extended preferences (see for instance Becker [6]). Here we take a short-cut by introducing a mark-up (θ_i) on substantive utility. Extended utility is then defined as:

$$y_i = \theta_i x_i,\ \theta_i \geq 1,\ i = r, m.$$

It is assumed that under market exchange extended utility coincides with substantive utility ($\theta_m = 1$). Reciprocal exchange conveys symbolic utility as people value social interaction as such ($\theta_r > 1$). The above set of equations can be combined to:

$$y_r = \theta y_m, \tag{1}$$

where $\theta \equiv (\theta_r x_r)/x_m$. As substantive utility is fixed x_r and x_m can be treated as constants. It seems plausible to assume that θ_r, and therefore θ, depends on the fraction of people engaged in market exchange, m. If the number of people in gift exchange declines it will be harder to uphold a sense of community spirit. As the market regimes expands, individualism spreads and solidarity may become less attractive. These considerations lead to a negative relation between the valuation ratio θ and the fraction of people in the market regime. However, according to Adam Smith it can be maintained that the need for mutual sympathy and respect is deep-rooted and cannot be suppressed entirely. A similar view based on biological principles is expressed in Kropotkin [17]. It is not unreasonable to assume that the ramification of this becomes more distressing as the market gets to dominate exchange relations. This could imply a positive relation between θ and the market size after some threshold level of market participation has been passed. Thus we have that $\theta = \theta(m)$ is first decreasing and after some critical point, say m', increasing, because the market becomes "too large".

More specifically, the U-shaped $\theta(m)$-curve can be seen as the result of opposite forces. First, as more people leave the regime of reciprocity the cost (in disutility terms) of changing beliefs for the remaining people decline. This idea builds on the literature on cognitive dissonance in psychology. Following Festinger [11] it can be stated that changing beliefs induces a negative arousal. Moreover, the resistance to change crucially depends on the difficulty of finding people who support the new belief. Therefore, the more people are already in the market regime the easier it becomes for people to

switch regimes. It is in particular hard for the first few individuals that are to switch. This is shown by the dashed downward sloping RC-curve (resistance to change) in Figure 2 . Second, as the market system expands the social deficit increases. As argued in Bowles [7] markets are characterised by impersonality and ephemerality of contact. But people also want to socialize. There is a need for mutual sympathy and recognition. If reciprocal exchange is relatively large market participants may have the feeling that the social deficit can be easily repaired. The more people are available as potential candidates to socialise with, the easier it is to change back to reciprocal exchange. Therefore, the opportunity costs (in disutility terms) of switching to the market regime increase as the market system becomes more dominant. The social deficit is felt more heavily. This gives rise to the dashed upward sloping SD-curve (social deficit) in Figure 2 . Under appropriate conditions the summation of both curves may lead to an U-shaped function $\theta(m)$ as illustrated by the bold curve in Figure 2. To analyse different possibilities, the equilibrium solution discussed in section 3.1 will be based on a monotonic decreasing θ-curve. This case eventuates in the corners as the only solutions. The U-shaped θ-curve will be introduced in section 3.2. As it turns out, this opens the possibility to derive interior solutions.

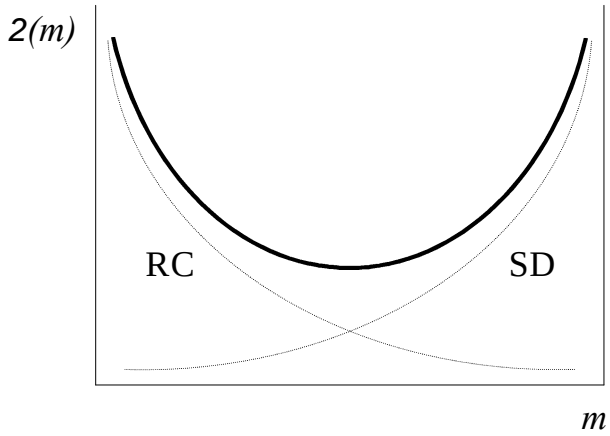

Figure 2

It should be noted that there is a close parallel with the descriptive approach of Fukuyama [11]. In his latest book Fukuyama describes "the great

disruption" of the social system starting somewhere in the sixties under influence of the upcoming information technology. The change of a traditional industrial society towards an economy dominated by the service sector leads to a certain disorientation and as a consequence of this to a decay of moral values. But according to the author things have changed lately. The reason is that human nature is geared towards cooperation and reciprocity. Fukuyama bases his view on the biological approach going back to Kropotkin [17]. The reconstruction of the social order is reflected in declining criminality statistics and positive evaluation of social relations in systematic surveys. Such a change may lead to a new equilibrium with a certain amount of gift exchange in the current market economy. In our model it is the upward sloping branch of the $\theta(m)$ curve which reflects the views of Fukuyama and others on the viability of the moral system in modern times.

2.2 Reciprocal Exchange

The timing in a reciprocal exchange relationship is as follows. Each two periods a complete reciprocal gift exchange can be accomplished. In the first period, one of the agents produces first and the other consumes the good. In the second period they switch roles. Whenever they consume, they derive utility y_r, and whenever they produce they bear a cost in disutility terms of c[4]. The discount factor for the next period equals $\delta = e^{-\rho}$, where ρ is the subjective discount rate.[5] Agents are infinitely lived. Let V_{rp} and V_{rc} denote the lifetime discounted utility of the agent that is involved in reciprocal exchange and starts as producer and consumer respectively. The agent starting as a producer incurs a cost (c) and expects to be in the position of a consumer next period:

$$V_{rp} = -c + \delta V_{rc}.$$

Similarly, the lifetime discounted utility of the agent that starts as consumer, V_{rc}, is given by:

$$V_{rc} = y_r + \delta V_{rp}.$$

[4]For simplicity we assume that the complete production of an individual is exchanged. A more realistic extension would be that individuals exchange only part of their production.

[5]A natural restriction on the discount factor is that $\delta \in (0, 1)$: future revenues are valued positively but less than current revenues.

It is further assumed that each agent ends up being first consumer or producer with equal probability. Expected discounted lifetime utility is then given by $V_r = \frac{1}{2}(V_{rp} + V_{rc})$ or, after substitution and rearranging terms:

$$V_r = \frac{y_r - c}{2(1-\delta)}. \tag{2}$$

The element of trust is introduced by the possibility of ending the relationship. An agent can decide to consume first, but not to produce in return. He then consumes and enters the market. Whenever he does, the other agent will of course take notice of being cheated and as a punishment he will end the relationship[6]. As a consequence, both agents will have to enter the market. Obviously, the agent will deliberate upon producing in order to sustain the relationship or to cheat upon his partner. Whether the agents decide to cheat and enter the market or stay in the reciprocal exchange relationship is dependent on the derived utility of being in the market regime, V_u (to be specified later on), and of the derived utility in the reciprocal exchange relationship, V_r. The following definition shows a Nash-equilibrium constraint under which both agents will decide not to cheat (a derivation is given in the appendix).

Definition 1 (*enforceability*) *A reciprocal exchange relationship is enforceable if* $-c + \delta V_r(\cdot) \geq V_u(\cdot)$.

The constraint is more likely to be satisfied when the discount factor is high (low subjective discount rate) or when the market size is small. The higher the future is valued, the less beneficial it is to cheat and so reciprocal exchange is more easily enforceable. Alternatively, we can interpret the subjective discount factor as a measure of trust. If the discount factor is low, then the faith in getting consumption in return is poor. The lower the discount factor, the harder it is to uphold the relationship. The market, on the other hand, is characterized by increasing returns to scale. The larger the market, the more easy it is to find a partner to trade with. This implies that the value of trading on the market is positively dependent on the

[6] This tit-for-tat is only one of many possible strategies. The strategy is common in the microeconomic literature. The classic defence is given in Axelrod [4]. More interestingly, the strategy is defended by Aristotle on principles of justice: "Now if proportionate equality between the products be first established, (...) then reciprocation take place (...) but if this is not done, the bargain is not equal, and intercourse does not continue." (Aristotle [1], p. 283).

market size[7]. The enforceability constraint is therefore harder to satisfy at larger market sizes. Detailed comparative statics are provided in section 3.3. We now turn our attention to the determination of the value of entering the market.

2.3 Market Exchange

Agents that have decided to enter the market do not have a fixed trading partner. They enter the market "unemployed", that is with no goods, and have to search for production possibilities. This will be represented by a Poisson process with arrival rate a. They can either accept or not accept the production opportunity. After they have found and accepted one they bear the same disutility costs c as in reciprocal exchange. Being employed they still have to search someone to trade with. They find someone with probability $b(m)$. Having found a trade partner they exchange and derive utility y_m.[8] The market is characterized by increasing returns to scale in the form of an externality. As the fraction of the population on the market, m, gets larger, average search time decreases or equivalently $b'(m) > 0$. Recall that r, u, m are the fractions of the population in reciprocal exchange, unemployed on the market, and employed on the market respectively (see also Figure 1). If we normalize total population to unity then $u = 1 - r - m$. The flow dynamics in the market can then be described by the differential equation:

$$\dot{m} = a(1 - r - m) - b(m) \cdot m. \tag{3}$$

Here, $\dot{m} \equiv dm/dt$. The fraction of people on the market increases with the number of agents finding a production possibility and decreases with the number of agents accomplishing their exchange.

In the remainder of the paper the focus is on steady state solutions. Steady states are marked by a constant distribution of agents over states, hence we have a constant rate of employment: $\dot{m} = 0$. Based on this assumption we can derive the value equations of the agents on the market. Let V_u and V_m denote the discounted lifetime utility of being unemployed and employed

[7] From (4) introduced later in the text, it is easily proved that V_u is indeed (weakly) increasing in m.

[8] The market is typically characterized by the use of money. Diamond [9] explicitly takes money into account by distinguishing between unemployed, buyers, and sellers. Here we assume that buying and selling simultaneously take place. None of the results are sensitive to this assumption.

respectively. Under the assumption of a steady state, $dV_u/dt = dV_m/dt = 0$ and the value equations are given by:

$$\begin{aligned} \rho V_u &= a(V_m - V_u - c), \\ \rho V_m &= b(m)(y_m + V_u - V_m). \end{aligned}$$

This set of equations can be rewritten in terms of V_u. Since unemployed agents on the market always have the possibility of not accepting a production possibility, due to high costs, V_u is always nonnegative[9]:

$$V_u = \max\left\{\frac{a}{\rho}\left[\frac{b(m)(y_m - c) - \rho c}{\rho + b(m) + a}\right], 0\right\}. \tag{4}$$

Definition 1 is now completely determined by equations (1)-(4). Together with the steady state condition that $\dot{m} = 0$ this describes the long-run equilibrium.

3 Equilibrium

Based on the steady state assumption, this section explores the consequences of different assumptions on the shape of the valuation ratio $\theta(m)$. We stay close to the disquisition in the introduction and section 2.1. Thus in section 3.1 we examine the steady state solutions when the valuation ratio θ is monotonically decreasing in the market size and in section 3.2 we allow for an increasing part of the θ-curve for large market sizes. Finally, comparative statics are provided in section 3.3. Throughout we use the notion of a short-run equilibrium whenever $\dot{m} = 0$ and of a long-run equilibrium when $\dot{m} = 0$ and, in addition, definition 1 is satisfied.

3.1 Complete Commodification

Where markets replace social relations we speak of commodification. Complete or full commodification indicates a situation in which markets expand to an extent where all social relations are abolished. Under incomplete or partial commodification social relations are still embedded in the community, but are partly driven out by the existence of markets. In this section

[9] We exlude negative values of V_u by assuming that agents can choose for complete idleness with $V_u = 0$.

we consider the case where θ is monotonically decreasing in the market size (for reasons given in the introduction and section 2.1). As it turns out, this is a situation where, if any, *full* commodification results.

Figure 3 below depicts this case[10]. The E_r and E_u curves show respectively the LHS and the RHS of the enforceability constraint in definition 1. Therefore, whenever the E_r lies above the E_u curve reciprocal exchange is enforceable, and for market sizes where E_u lies above E_r agents maximize expected utility by entering the market. The value of being unemployed increases in the market size and is therefore upward sloping. The value of reciprocal exchange depends on the valuation ratio $\theta(m)$ and is therefore downward sloping. The curves are drawn for the range $[0, \tilde{m}]$. These are the possible short-run equilibrium market sizes. The upper limit is given by $\tilde{m}$; the maximum possible market size for which no agents are involved in reciprocal exchange, i.e. $r = 0$.[11] The critical value of the market size at which the enforceability constraint holds with equality is given by m_1. At all market sizes $m \leq m_1$ reciprocal exchange is enforceable. Whenever the market size for some reason exceeds the critical size m_1 the market size is too large for reciprocal exchange to be enforceable and eventually all agents will enter the market. This cannot be a long-run equilibrium. The only possible long-run equilibria are when economy ends up in a corner solution[12]. As appears from equation (3) the long-run equilibrium in case people opt for the market regime equals $\tilde{m}$. Thus we see that for some market sizes reciprocal exchange is enforceable and that for larger market sizes the economy will converge to a market exchange economy. It is clear from the picture that if the E_u curve is everywhere above (below) the E_r curve then reciprocal is never (always) enforceable no matter what the market size is[13].

[10] The following set of parameters is used to obtain the figure: $\{a, b, c, g, h, y_m, \delta\} = \{.8, .6, 1, -.1, .3, 8, .8\}$ where we assumed that the probability of finding a trading partner on the market is linear in m: $b(m) = b \cdot m$ and the subjective valution is given by $\theta(m) = h + gm$. This set of parameters assures that both exchange mechanisms are enforceable for some market sizes for a value of θ in the range: $\underline{\theta} < \theta < \overline{\theta}$. (see section 3.3).

[11] Thus from equation 3 and the definition of short-run equilibrium $\tilde{m}$ is such that $a(1 - \tilde{m}) = b(\tilde{m}) \cdot \tilde{m}$.

[12] By a corner solution, we mean that either the economy sticks to its initial market size (possibly at a positive level) or converges to a market size of $\tilde{m}$.

[13] However, $V_u = 0$ at $m = 0$ and if E_r is everywhere below E_u then E_r must be negative. But V_r can still be positive and the case is therefore meaningful.

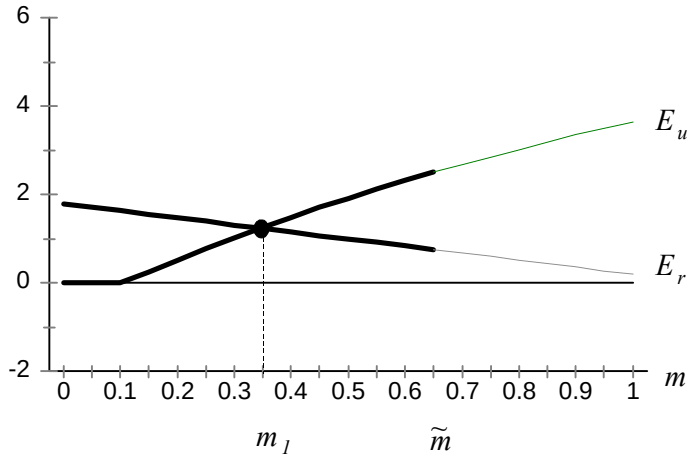

Figure 3

3.2 Partial Commodification

In the previous section, the valuation of reciprocal exchange was assumed to be monotonically decreasing in the market size. However, as mentioned earlier (notably in section 2.1) it is more likely that the valuation depends on the market size in a slightly more sophisticated way. Despite the decreasing disutility costs of changing beliefs, the feeling of a social deficit that cannot be repaired becomes distressingly oppressive and the wish for sustaining existing reciprocal relationships becomes increasingly weighty. Thus we have that $\theta(m)$ is first decreasing in m and after some point increasing in m. The E_r curve will for that reason behave similarly because of its dependency on $\theta(m)$. Figure 4 below depicts this case[14].

[14]Here $\{a, b, c, g, h, j, y_m, \delta\} = \{.8, .6, 1, -.24, .24, .7, 8, .8\}$ where $b(m)$ is as in footnote 10 and the subjective valution is given by $\theta(m) = h + gm + jm^2$.

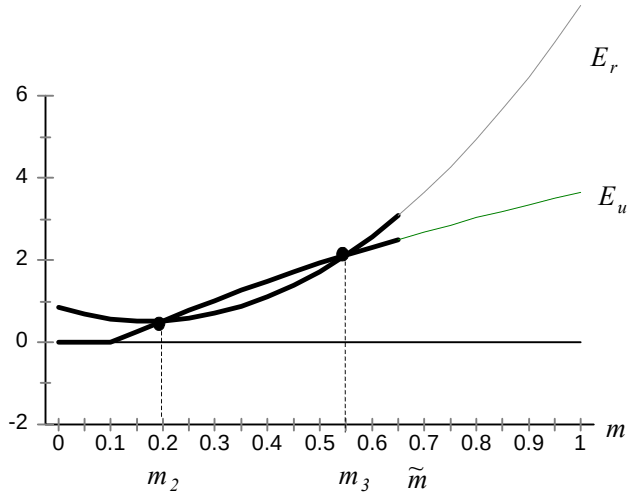

Figure 4

An interesting feature of the variable subjective valuation is the possibility of multiple interior equilibria. For example, in the figure above there are two interior equilibria, of which one is stable (m_3). For small market sizes below m_2 the search costs are too high to enter the market. However, at larger market sizes the search costs are lower and the subjective valuation of the market is higher. This is true for all market sizes between m_2 and m_3. Reciprocal exchange is no longer enforceable and agents enter the market. But contrary to the case in the previous section where θ is monotonically decreasing and where eventually everybody would be engaged in market exchange, there is a point m_3 at which the market is so large that agents have relatively high preferences for reciprocal exchange again. At this point, the market will stop growing and part of the population will stay in their reciprocal exchange relationship. An interior long-equilibrium solution is therefore obtained, potentially explaining why gift exchange continues to exist in the contemporary environment that is chiefly market oriented.

3.3 Valuation, Patience, and Viability.

Next, we turn to comparative statics. In general, reciprocal exchange can be enforceable for some small market sizes but not for large markets. The extent to which reciprocal exchange is enforceable is first of all obviously depending on the relative valuation (θ) of reciprocal exchange. Likewise, it depends on the discount rate (δ) which can alternatively be interpreted as a

measure of trust (see also section 2.2). The next two propositions typify the general relation between the two variables.

Proposition 1 *For every $\delta \in (0,1)$ there exist positive $\underline{\theta}(\delta)$ such that $\forall\theta(m) \geq \underline{\theta}(\delta)$ reciprocal exchange is enforceable and $\forall\theta(m) < \underline{\theta}(\delta)$ reciprocal exchange is not enforceable. $\underline{\theta}(\delta)$ is first decreasing in δ and then, if $\theta(m) > \theta(0)$ for some m, possibly increasing in δ.*

Proposition 2 *For every $\delta \in (0,1)$ there exist positive $\overline{\theta}(\delta)$ such that $\forall\theta(m) \geq \overline{\theta}(\delta)$ market exchange is not enforceable and $\forall\theta(m) < \overline{\theta}(\delta)$ market exchange is enforceable. $\overline{\theta}(\delta)$ is first decreasing in δ and then possibly increasing in δ.*

Proof. All proofs of the propositions appear in the appendix. ■

Based on these propositions, figure 5 represents the typical shape of the $\underline{\theta}$-curve and the $\overline{\theta}$-curve for all possible combinations of θ and δ.

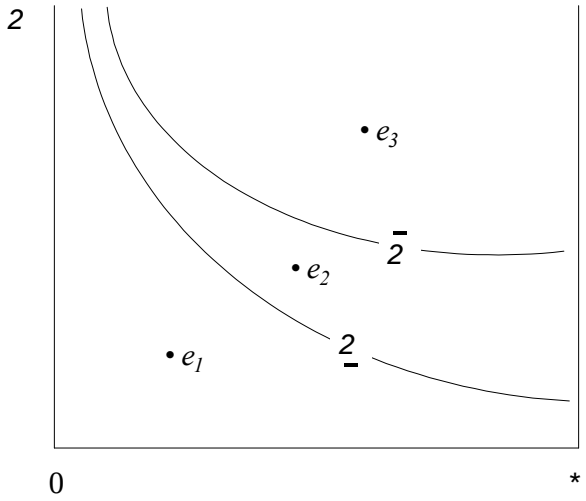

Figure 5

In this figure, we plotted the areas for which reciprocal exchange is not enforceable for any market size, for which it is enforceable at positive market sizes, and for which it is enforceable at any market size. The latter implies that market exchange is not enforceable at any market size. Thus for example, at e_1 reciprocal exchange is not enforceable at any market size ($\theta < \underline{\theta}$), whereas at e_3 market exchange is not enforceable at any market size ($\theta > \overline{\theta}$). The point e_2 is an in-between case where at some market sizes, but not all, reciprocal exchange is enforceable, and at some market sizes market exchange

is enforceable. The latter case is exactly the one which figures 2 and 3 are based on. In contrast, e_3 for instance would describe the case where the E_u curve lies entirely above the E_r curve.

As can be seen from Figure 5, at higher discount factors reciprocal exchange is enforceable at lower values of θ. In other words, when the discount factor or the measure of trust is low, cheating is relatively profitable and the subjective valuation of the reciprocal good must consequently be high for reciprocal exchange to be enforceable. Exactly the reverse is true for the case of market exchange, i.e. at higher discount factors, it becomes less likely that market exchange is enforceable[15].

Here we have a resemblance with optimal contract theory. For example in Baker et al. [5] a firm has to choose an optimal bonus system. They can either rely on an objective but imperfect performance measure or on an unbiased but not objectively measurable variable. In the former case the firm can rely on an explicit contract (we loosely interpret this as the money reward in case of the market exchange), in the latter only on an implicit contract (i.e. based on trust). They show that under appropriate conditions, the optimal contract is a combination of the implicit and the explicit contract. But whenever the discount rate is sufficiently high only implicit contracts should be used whereas for sufficiently low discount rates one should rely on explicit contracts only.

4 Welfare

In this section we take a welfare perspective by comparing the efficiency of stable equilibria. We follow Kranton [16] by taking the weighted discounted lifetime utility of agents on the market as the measure of comparison, but none of the results hinge on this. The weights are the shares of the employed and unemployed agents. Thus, we have:

$$V_w \equiv \left[1 - \frac{m}{1-r}\right] V_u + \frac{m}{1-r} V_m.$$

Evidently, $V_u \leq V_w \leq V_m$. Since both V_u and V_m are increasing in the market size, so is V_w. We now state:

[15] The interpretation that for high discount rates the $\underline{\theta}$ and $\overline{\theta}$ curves can be increasing is somewhat complicated and is therefore deferred to the appendix.

Proposition 3 *It is possible that there exist stable equilibria which are Pareto-dominated by other equilibria. As a consequence, inefficient market sizes can be sustained.*

Proposition 3 relies on a rather strong criterium of Pareto-optimality, namely where state i is socially preferred to state j if in state j no agent is worse-off than in state i and at least one is better off, without taking into account the possibility of income redistributions. This is stronger than the Kaldor-Hicks criterium and the Pareto-criterium where income redistribution is allowed. Clearly, under the weaker versions of Pareto-optimality proposition 3 is as well satisfied.

The rational behind proposition 3 is intuitively clear. The reason that dominated stable equilibria can be maintained is caused by the existence of an external effect and a coordination failure. In essence, if reciprocal exchange is initially large, search costs on the market are high, even though search costs would be low if the market was large. Similarly, if the market starts out large, search costs are low and reciprocal exchange relationship may not be enforceable even though if the market was small they would be preferable in value terms. Besides this thick-market externality there is also a coordination failure. People do not take into account the full value of a reciprocal trade in deciding between market and reciprocal exchange. A social planner would value reciprocal exchange by its present value: V_r. But individuals only take into consideration the value of reciprocal trade for which it can be trusted upon that the relationship can be maintained: $-c + \delta V_r$ (see definition 1). The gap between those values can be considered as a coordination failure caused by mutual distrust. As a consequence, if the market starts out large, there can be a degree of trust that is insufficient to maintain the reciprocal exchange relationship even though if it could be maintained it would be superior to market exchange in value terms. Proposition 3 is illustrated below by means of a graphical treatment (see the appendix for the formal conditions).

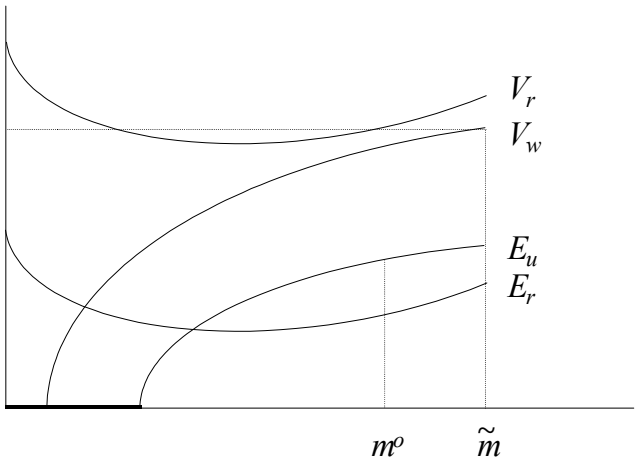

Figure 6a

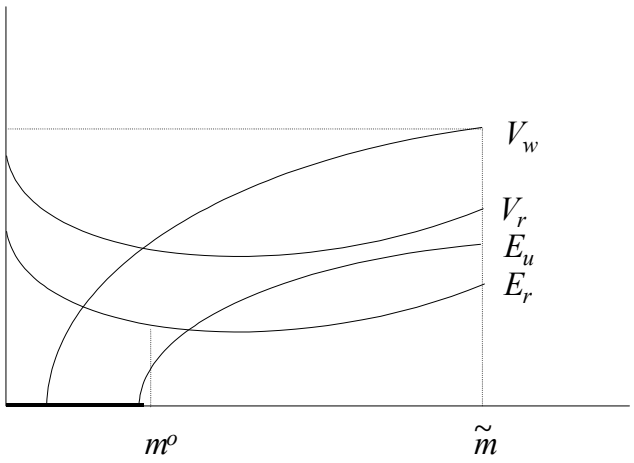

Figure 6b

In the upper panel of figure 6 the initial market size is denoted by m°. At m°, definition 1 is not satisfied, and the economy tends to move to $\tilde{m}$, the maximum sustainable market size ($r = 0$)[16]. It is immediately seen that at $\tilde{m}$ the value of being in a reciprocal exchange relationship is higher than that of being on the market: $V_r > V_w$. Therefore, if all agents would be involved in reciprocal exchange they would *all* be better off. The lower panel of the

[16]It is evident that the economy could as well converge to a stable interior equilibrium such as m_3 in figure 4.

figure illustrates the case where reciprocal exchange is sustainable although everyone could in principle be better off by entering the market.

The preceding analysis shows that individual agents need not necessarily select the socially most efficient exchange mechanism nor that there is any tendency towards a Pareto-optimal equilibrium. There are of course ways to change incentives towards the first best solution, such as a subsidy on entering the market or lowering search costs in one way or another. Due to the hysteresis present such a subsidy need only be a temporary one. Stimulation to form reciprocal relationships seems to be of a more difficult order. A one-sided inquiry into the market mechanism clearly would disguise aspects of critical importance.

5 Concluding Remarks

Many economic activities imply a certain gift-dimension. In the literature gifts are discussed from different perspectives (see for example Vandevelde [18]). In this paper we hold the view that the logic of the gift contains some notion of reciprocity. There are no free gifts in case the institution of gift-giving is considered as a coordination mechanism to cope with the state of nature. Market exchange and gift exchange have therefore something in common: the reference to the notion of reciprocity. But reciprocal exchange is based on personal relationships and trust whereas market exchange is based on anonymity and money.

If there are two distinct modes of exchanging goods the question arises whether these modes are in some sense commensurable. Here again we take sides by assuming that market exchange and reciprocal exchange are commensurable by extending preferences. Gift-giving, and thus reciprocal exchange, renders symbolic utility as people value the idea of belonging to a group or society at large. Symbolic utility and substantive utility, which relates to traditional economic activities, are different components of the extended utility function.

Starting from these premises the main question to be answered is under which circumstances reciprocal exchange is viable and not crowded-out by the market regime. Such a form of crowding-out can be conceived as a complete commodification of society. Following Kranton [16] reciprocal exchange is modelled in a strict manner. Agents expect a counter-performance. Market exchange is modelled as a search process where in case of matching

goods are exchanged immediately. The model is closed by introducing an enforceability condition showing under which conditions agents defect in case of reciprocal exchange. The condition critically depends on the market size and one the discount factor. The latter has its resemblance in the optimal contract literature once we loosely interpret market exchange as an explicit contract and a reciprocal relation as an implicit contract.

It is shown that complete commodification obtains if symbolic utility declines as the relative size of the market increases. However, reciprocal exchange may survive for low subjective discount rates which are in some sense indicative for a high level of trust. There is another reason why full commodification may not be the equilibrium outcome. Symbolic utility may rise if reciprocity becomes scarce as the market takes over. In the end people may be aware of a social loss and revalue reciprocal exchange accordingly. As a result commodification will stop at some point and there will be an interior equilibrium solution with market exchange and reciprocal exchange coexisting.

From a welfare point of view full or partial commodification is not necessarily superior to reciprocal exchange. It is shown that agents need not necessarily select the exchange mechanism that is Pareto-optimal. This result is related to the search externality in market exchange and the coordination failure in reciprocal exchange. If the market is large initially, search costs are low and the economy may converge to an inefficient outcome. Similarly, the economy may converge to an inefficient outcome if the coordination failure with respect to the choice of reciprocal exchange is important.

What seems most urgent in additional research is a more flexible way of modelling reciprocal exchange to cope with the different aspects of gift-giving. In particular, it may be rewarding to shed some light on intergenerational gifts, where reciprocity in the usual sense is out of reach or where the time interval is extremely long. The latter is for example the case in family relationships where parents take care of their children in the hope of mutual care once they themselves become dependent on their children's readiness to support them. In addition it may well be more realistic to assume that some goods are more suited to be produced on the market (e.g. bread) and others to be offered in a reciprocal relationship (e.g. insurance). Individuals can be assumed to be heterogeneous and spend their time in different proportions over the two exchange mechanisms. Another interesting question emenates from the paradox formulated by Etzioni ([10], p. 250): "The more people accept the neoclassical paradigm as a guide for their behavior, the more the

ability to sustain a market economy is undermined". The paradox suggest that market exchange becomes less efficient if morality is on the retreat. This need not be true, as our analyisis suggests, but it certainly deserves serious consideration.

6 Appendix

In this appendix we first show that definition 1 characterizes a Nash-equilibrium and subsequently proof propositions 1 to 3. Where no confusion can arise we simply write θ instead of, for example, $\theta(m)$.

Proof that Definition 1 is a Nash-equilibrium.

Proof. Consider the payoff matrix below. Players are denoted by P and C, the agent that produces and the one that consumes first respectively. They can either be honest, H, or cheat, D (defect). The pay-offs are in utility terms. As an example, consider P playing honest and C cheating, then P produces the good, bearing cost in utility terms of c and enters the market the next period after finding out of being cheated, δV_u. C consumes y_r, does not produce in return and enters the market getting δV_u. Thus in the upper-right cell we have the pay-offs $-c+\delta V_u$ and $y_r+\delta V_u$. Consider then the strategies $\{H;H\}$. This can, by construction, only be a (weak) Nash-equilibrium if it is in both players advantage not to deviate: $-c+\delta y_r+\delta^2 V_r \geq \delta V_u$ and $-c+\delta V_r \geq V_u$. Fortunately, we can show that first inequality is implied by the second. Note that $\frac{1}{(1-\delta)}y_r \geq \frac{1}{2(1-\delta)}(y_r-c_r)=V_r$ (see equation 2). Then $\delta y_r+\delta^2 V_r \geq \delta V_r$. If now $-c+\delta V_r \geq V_u$ (second constraint) then it is surely the case that $-c_r+\delta y_r+\delta^2 V_r \geq V_u \geq \delta V_u$ which proves the first inequality. Finally note that $\{D;D\}$ is always a (weak) Nash-equilibrium. ■

$P\downarrow; C\rightarrow$	H	D
H	$-c+\delta y_r+\delta^2 V_r; y_r-\delta c+\delta^2 V_r$	$-c+\delta V_u; y_r+\delta V_u$
D	$\delta V_u; \delta V_u$	$\delta V_u; \delta V_u$

Proof of Propositions 1 and 2.

Proof. We try to find values of θ for which definition 1 is satisfied with equality: $-c+\delta V_r = V_u$. Label this equality D1. For this value agents are indifferent between reciprocal exchange and entering the market given the market size. For higher values of θ they prefer reciprocal exchange, for lower values they prefer market exchange. In particular we try to find values of θ, say $\underline{\theta}$, for which the equality is satisfied but will not be satisfied for any lower θ for *any* market size. It is instructive first to consider the case where θ is (weakly) monotonically decreasing in m and then generalize the results, as in the main text. The advantage of this is that if reciprocal exchange is enforceable at all, it is certainly enforceable at $m=0$ since V_r is decreasing in m and V_u increasing in m. Thus, we can focus on $m=0$. Then D1 reads,

by restricting V_u to R_+:

$$\frac{\frac{1}{2}\delta(\theta y_m + c) - c}{1-\delta} = 0. \tag{A1}$$

Since we put no restrictions on θ, given any $\delta \in (0,1)$ there exists a $\underline{\theta}$ such that the equality holds (and is in this particular case easy to find). (As a marginal comment, note that as $\delta \to 1$, the numerator of the LHS of A1 approaches $\frac{1}{2}(\theta y_m - c)$ which equals zero for some $0 < \theta \leq 1$.). Since the LHS of D1 is increasing in δ, $\underline{\theta}$ is lower for higher values of δ.

Generalizing the argument, we see that the RHS can be positive for markets $m > 0$, but also that $\theta(m)$ may be larger than $\theta(0)$. So even if the equality holds at $m = 0$, it may well be that the LHS is larger than the RHS at positive market sizes. The critical value of θ (i.e. $\underline{\theta}$) can therefore be lower than the value of θ for which the equality holds at $m = 0$. The caveat in the generalization is, however, the fact that V_u is now increasing in δ as well. At $m = 0$, $V_u = 0$ no matter what the rate of time preference is. This remains true up to the market size where V_u becomes strictly positive. For the range of values for which V_u is strictly positive, V_u is also increasing in δ. Thus both sides can be increasing in δ at some market sizes, and the relation between $\underline{\theta}$ and δ becomes ambiguous. We stress however that for low values of δ, $V_u = 0$, and hence there exists an interval where $\underline{\theta}$ and δ are negatively correlated. The intuition behind this increasing part is that because on the market costs are made before revenues, for sufficiently low discount rate the present value is negative, whilst in a reciprocal exchange with some probability you consume before you produce and so even for low (but positive) disount rates expected gains are positive for some valuation ratio.

As a special case, if $\theta(m) \leq \theta(0)\ \forall m$ (in other words θ is nonincreasing), then $\underline{\theta}$ can be determined by inspection of $m = 0$ alone (since if then reciprocal exchange is not enforceable at m, and since V_u is nondecreasing and V_r nonincreasing in the market size, then it is not enforceable at any m). Since at $m = 0$, $V_u = 0$, if the disount rate increases a little, V_u remains zero but V_r increases so $\underline{\theta}$ unambiguously declines. But note that such an unambiguously declining $\underline{\theta}$-curve is only a special case and that it is not directly related to the shape of $\theta(m)$.

The same line of argument can be used to derive proposition 2. Here the aim is finding the θ such that market exchange is just enforceable at one particular market size, and not for any higher θ. We first try to find $\overline{\theta}$ in the

case of nonincreasing θ so that the focus can be restricted to $m = 1$. We do not state the proof here. ■

PROOF OF PROPOSITION 3.

Proof. The proof consists of showing that it need not be contradictory to have a stable equilibrium that is inefficient in the sense that it is Pareto-dominated by another stable equilibrium. Denote the two equilibria under investigation by m_i and m_e (the subscripts stand for inefficient, efficient). Let the initial point be the inefficient equilibrium m_i. Three cases are to be considered: 1. m_i is at one of the corners of the economy. If $m_i = 0$ then it is stable if $-c + \delta V_r \geq V_u$. 2. If $m = \tilde{m}$ then it is stable if $-c + \delta V_r > V_u$. 3. m_i is an interior solution. It is stable if $-c + \delta V_r = V_u$ and if $\delta \frac{dV_r}{dm_i} \geq \frac{dV_u}{dm_i}$.

We have to show that the following set of equations need not be inconsistent:

$$\begin{aligned} V_r(m_e) &\geq V_r(m_i), \\ V_w(m_e) &\geq V_w(m_i). \end{aligned}$$

Additionally, the enforceability constraints have to be satisfied as indicated at m_i and m_e. Consider for example the case where m_i is the corner solution $m = 0$ and m_e is an interior stable solution that Pareto-dominates the corner solution. Thus we have:

$$\begin{aligned} V_r(m_e) &\geq V_r(0), \\ V_w(m_e) &\geq V_w(0), \\ -c + \delta V_r(0) &\geq V_u(0). \\ -c + \delta V_r(m_e) &= V_u(m_e) \end{aligned}$$

The second inequality is naturally satisfied. (Indeed, since $V_w'(m) > 0$, the only case where an equilibrium can be dominated by a smaller market size is where $m = 0$ since otherwise all remaining market participants would lose some welfare. *Except*, of course, when nobody stays!). Since we put no restrictions on θ the first inequality can be satisfied as well (not, however, when $\theta(m)$ is nonincreasing in the market size). Combining the (in)equalities we see that as long as V_r is increasing over the interval $[0, m_e]$ (but remember that it may be decreasing in the first stage and increasing thereafter), but not as fast as V_u there is no inconsistency and it cannot be ruled out that $m = 0$ is indeed inefficient. Other cases can be analyzed in a similar manner and are omitted. The result of possible inefficiency is easily extended to the

nonweighted case for V_m, V_u, and V_w all behave in a similar way (namely increasing in the market size).

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