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ABSTRACT

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This paper aims at a better understanding of the conditions under which unequal rank or power positions may get permanently established through asymmetric gift exchange when a gift brings pride to the donor and shame to the recipient. Such a framework matches numerous observations reported in the sociological and anthropological literature dealing with patronage relations in traditional setups. A central result derived from our model is that an asymmetric gift exchange equilibrium can occur only if the importance attached to social shame by a recipient is smaller than that attached to social esteem by a donor. Moreover, if this (necessary) condition is fulfilled, an asymmetric gift exchange will take place only if the recipient's productivity is neither too high nor too low. Finally, the possibility of a parasitic response of the gift recipient is more likely to be observed when the donee's sensitivity to social shame is low, or when his productivity is high. *Journal of Comparative Economics* **38** (3) (2010) 267–282. Center for Research in the Economics of Development (CRED), University of Namur, Rempart de la Vierge, 8, 5000 Namur, Belgium.

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1. Introduction

Gift exchange relationships, in contrast to market-mediated relationships, have attracted the attention of economists only recently. This new interest emerged, in particular, within the fields of development microeconomics and the economics of organizations understood as networks of agency relations or contracts. Drawing inspiration from anthropological writings dealing with gift exchange and reciprocity in traditional setups (see [Platteau \(1991\)](#), for a review), development economists have embarked upon devising and testing theories of reciprocal state-contingent transfers conceived as informal mutual insurance mechanisms (see, e.g., [Kimball, 1988](#); [Fafchamps, 1992](#); [Coate and Ravallion, 1993](#); [Paxson, 1993](#); [Townsend, 1994](#); [Udry, 1994](#); [Morduch, 1999](#); [Dercon and Krishnan, 2000](#); [Ligon and Worall, 2002](#)). A *quid pro quo* is clearly involved in these voluntary transactions since, as pointed out by a renowned anthropologist a long time ago, 'everybody is thereby insured against hunger: he who is in need today receives help from him who may be in like need tomorrow' ([Evans-Pritchard, 1940: 85](#)).

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Labor relations or contracts provide another interesting application of the economics of reciprocity. Where effort and quality are difficult to monitor, an employer may pay workers wages exceeding the market-clearing levels in order to elicit effort and commitment from them. The extra wage is then conceived as a gift which the worker returns by providing adequate amounts of effort and attention (Akerlof, 1982; Fehr et al., 1998; Fehr and Gaechter, 2000). As for Holmstrom and Milgrom (1991), they detect elements of discretionary gift exchanges in any fixed wage. In an alternative approach, gift exchange takes on an intergenerational form when parents promise bequests (including inter-vivos transfers) to their children in the expectation to receive attention from them in their old age (Bernheim et al., 1985; Hoddinott, 1992; Cox and Rank, 1992; Barham et al., 1997; Johnson et al., 2001; Laferrère and Wolff, 2006). In an alternative approach, individuals come to the help of their old parents in the hope that, through a sort of demonstration effect, their own children will behave likewise when they will themselves reach an advanced age (Cox and Stark, 2005).

A last illustration is the theory of gift exchange proposed by Aoki (2001) (see also Carmichael and Bentley MacLeod (1997) for an approach using evolutionary game theory), which is actually very close to the type of account most commonly encountered in the anthropological literature. In this approach, the gift serves both as a signal to communicate a willingness to cooperate to a potential partner, and as a commitment device since, once the gift has been made, the donor's interest is to abide by a contract provided that the partner also does it.

It is noteworthy that in all the above examples transactions appear to be motivated by exchange rather than by altruism. In other words, the gift and the counter-gift are a manifestation of enlightened self-interest, or of selfishness with foresight. To characterize them as reciprocal altruism is therefore misleading. Somewhat misleading is the use of the term gift-exchange itself since the transaction at stake involves a *quid pro quo*, and therefore an implicit term of exchange. On the other hand, it is typical of economic conceptualizations that the reciprocal gesture takes on the same tangible form as the “gift” that triggered it. There is no doubt that such an approach is useful since it accounts for important situations encountered in reality. Sociologists and anthropologists, by contrast, pay attention to symbolic as well as to material aspects of so-called gift exchange relationships. As a consequence, there is the possibility that the payback takes on a form different from the medium of the original favor (Ekeh, 2004; 35). Commodities may thus be traded against symbolic attributes such as social prestige and political power: a material gift, which never goes un-repaid, can thus be reciprocated, say, by a demonstration of loyalty, allegiance, homage, respect, subordination, devotion, etc. . . In the conventional economic framework, such non-material considerations may be introduced as additional components of the utility function.

An immediate implication of the alternative approach is that exchanges can be asymmetrical, taking place between persons endowed with different wealth, rank or social status. In fact, as we have learned from the works of many anthropologists, more particularly Malinowski (1922), Mauss (1925), Polanyi (1944, 1968), Belshaw (1965), Sahlin (1960, 1974), Levi-Strauss (1969), and Bourdieu (1990), the whole point of the game may precisely consist for the dominant party of making sure that the tangible benefits or services that he renders (including insurance against the risk of hunger) can never be (fully) repaid. Being in his debt on the material level, the donee finds himself compelled to return the favor on another level, in ways that influence the donor's rank or status. Subordination is created and perpetuated because the obligation to reciprocate, which is a burden, cannot be relieved by means of a return gift equivalent to the initial gift (Offer, 1997; 455). Upon this reading, social prestige and political power originate in asymmetric exchanges. Moreover, in interactions where an agent (the donee or beneficiary) occupies an inferior rank or position *vis-à-vis* the other agent (the donor or benefactor), the former is likely to experience an aversive emotion of social shame or to incur the cost of subordination. Therefore, in analyzing political power or social status relationships in traditional contexts characterized by face-to-face (asymmetrical) relationships, two mirroring components of utility, one positive – the feeling of prestige or power – and the other negative – the emotion of shame – need to be taken into account simultaneously.

So far, economists have made only a few attempts to model social prestige and social shame simultaneously, and all these attempts are quite recent (Holländer, 1990; van de Ven, 2002; Gaspart and Seki, 2003; Brennan and Pettit, 2005; Platteau and Seki, 2007). The present paper follows up these efforts, since it aims at a better understanding of the conditions under which unequal rank or power positions may get permanently established through asymmetric exchange when a gift brings pride to the donor and shame to the donee, or when it confers power on the former while subordinating the latter. In our formal framework, these two aspects are treated analogously. We write a utility function embodying a term that reflects the symbolic advantages of esteem or power and, alternatively, the symbolic cost of shame or subordination. Power is thus conceptualized as the ability of an agent to “buy” the allegiance of another agent in the same way as the social esteem gained by an agent is “bought” at the cost of inflicting shame on another agent.

An interesting question that arises is whether the client will intensify or relax his effort while entering into a dependence relationship. There are indeed two forces pushing in opposite directions. On the one hand, the transfer makes his effort less necessary than before. This is the classical perverse effect of aid dependence. On the other hand, the beneficiary may wish to intensify effort in order to mitigate social shame. This is the new effect arising from our original framework. When effort is being relaxed as result of the transfer, we will say that the donee adopts a parasitic behavior.

As described above, the problem is still too broadly defined to yield useful predictions. In order to narrow it down, three key assumptions will be made. First, to allow for the possibility of gift refusal by a “proud” agent, we do not model the potential recipient's decision to accept or reject a gift as taking place in the final stage of the game. Second, social esteem/shame varies with the level of dependence of the donee on the donor rather than with the absolute amount of the transfer. Third, the donee chooses his effort strategically anticipating how, after observing the effort, the donor will adjust the amount of his

transfer to him. The feasibility problem arises because we cannot be certain that a solution exists that will make both the gift-maker and the gift recipient better off after than before the aid transfer.

The structure of the paper is as follows. Section 2 further motivates the analysis proposed by briefly reviewing two strands of relevant literature. First, attention is directed to the works of social scientists, anthropologists in particular, that vindicate our approach to power and status ranking. Thereafter, the rare attempts by economists to model social esteem and shame in a gift exchange setting are described and compared to the present endeavor. In Section 3, we present the basic assumptions underlying a general model, in particular those related to the structure of the game and information, and to the characteristics of the social esteem function. Our model is a one-period game (unlike models of reciprocal contingent transfers, or the model of gifts as commitment devices), with perfect information (unlike the model of gift exchange in labor relations), and non-contractible effort (like in the latter model). Moreover, since our main purpose is to discover how various dimensions of heterogeneity in the agents' characteristics are susceptible of giving rise to an asymmetric gift exchange equilibrium, the agents are allowed to have different effort productivities (owing to different talents or different endowments in physical or human capital), and different sensitivities to social esteem and shame. Thereafter, we derive the main results that can be obtained with a general form of the esteem function and, in particular, we highlight some conditions under which parasitism, understood as relaxation of effort on the part of the gift-receiver, is obtained, as well as a number of significant comparative statics results. In Section 4, we provide an illustration of the main results with the help of simulations based on explicit functions. This is with a view to better visualizing the working of the gift-making and acceptability conditions, and the manner in which the central parameters of our model interact with each other. Section 5, the concluding section, summarizes our main findings and proposes an application of our approach to the sphere of international relations.

2. Power or status as asymmetric gift exchanges

To explain power or status differentiation in terms of asymmetric exchange essentially means that the would-be dominant party tries to involve other members of the community in debt relationships. By accepting a gift indeed, the donee manifests his readiness to play the role of the 'grateful recipient' (Schwartz, 1967; 6). Thereby, he becomes an inferior and a subordinate, implying that he accepts the orders of the giver and complies with his wishes, thus rewarding him 'with power over himself as an inducement for furnishing the needed help' (Homans, 1961; 319; Blau, 1964; 21). In a like manner, Wintrobe (1998) considers that 'through the use of gifts, a donor, whether selfish or altruistic, can obtain power over recipients and induce their cooperation toward his or her own objectives' (p. 95).

Patronage relationships in the village societies of many developing countries seem to be grounded in such unequal exchange mechanisms, as attested by the frequent characterization of local patrons as 'Big Men' and the importance of symbolic exchanges of personal favors and obligations in this context (Polanyi, 1944, 1968; Pitt-Rivers, 1954; Belshaw, 1965; Scarlett Epstein, 1968; Levi-Strauss, 1969; Strathern, 1971, 1991; Breman, 1974; Scott, 1976; Bourdieu, 1990; Alexander, 1982; Feil, 1984; Platteau, 1995a). There are actually two different models of patronage and chieftaincy according to whether the making of regular tangible gifts by the dominant party is an obligation inherent in his power position, which is pre-established, or a means used toward creating the hierarchical order itself (Sahlins, 1963; Finney, 1972). The second situation, in which gift-making is the outcome of a strategic decision by a willing power-holder, is of more direct interest to economists. In this more relevant case, so-called gift exchange is a means by which the relations of domination and control are established. In the words of Mauss, 'the person who cannot return a loan loses his rank and even his status of a free man', which tends to happen in lineage-based economies where there is an unstable clan hierarchy changeable from time to time (Mauss, 1925; p. 42, p. 97, *fn.* 79; Gregory, 1982; p. 20). Anthropological research also suggests that in the struggle for power and status domination-oriented gifts can be made by persons acting as representatives of a clan or social group (Godelier, 2007; p. 77).

When considering the emergence of asymmetric power or status relationships in traditional social contexts, it is clearly important to bear in mind the cost of subordination, or what David Hume has called the "mortification" experienced by the subject person or the client.¹ There is actually solid psychological evidence not only that pride is a rewarding emotion commonly elicited by dominance, but also that shame is an aversive emotion typically elicited by subordination, and negatively correlated with self-esteem (Fessler, 2001; see also Frank, 1985, 1989; Robben and Verhallen, 1994; Offer, 1997; Clark and Oswald, 1998; Gaechter and Fehr, 1999).² This essential aspect has not escaped Marcel Mauss's attention: charity understood as unreciprocated gifts is "wounding" for the person who has accepted it. This is why we tend "to strive to do away with the unconscious and injurious patronage of the rich almsgiver" (Mauss, 1925; 65).

In Fessler's framework, there is no compensation (e.g., a gift) for social shame, and this is why people subject to this painful emotion tend to withdraw from interaction and, if it is not possible, they turn aggressive and attack the dominating individual in the hope of inverting the dominance relationship (Fessler, 2001; 199–200). His analysis indirectly confirms Bourdieu's proposition that, in societies pervaded by highly personalized face-to-face relationships, and where there are no institutionalized rules governing access to, and reproduction of power, power cannot be established in a direct and brutal manner lest the whole fabric of the society should be undermined and power prove unsustainable. In such circumstances where domination can only be exerted overtly, in its elementary form (from person to person), the practice of asymmetric

¹ For Hume, "we are more elevated with the view of one below us, than mortified with the presence of one above us" (Hume, 1888; Book II, Section X, 390).

² As pointed out a long time ago by Hume (1888), in the same way that 'anger and hatred bestow a new force on all our thoughts and actions', it appears that, 'humility and shame deject and discourage us' (Book II, Section X, p. 391).

gifts made ‘under the veil of enchanted relations’ epitomized by parent-children relationships, is the best method available to would-be patrons or chiefs concerned with making their authority accepted at a reasonable cost for the subject people:

So long as overt violence... is liable to provoke either a violent riposte or the flight of the victim –that is, in both cases, for lack of any legal recourse, the destruction of the very relationship that was to be exploited– symbolic violence, gentle, invisible violence, unrecognized as such, chosen as much as undergone, that of trust, obligation, personal loyalty, gifts, debts, ... presents itself as the most economical mode of domination because it best corresponds to the economy of the system (Bourdieu, 1990; 127).

To sum up, power is established and secured through the distribution of gifts which form “a symbolic capital” in the hands of the benefactor. To the extent that followers are obliged to him, and do not feel humiliated, they are ready to pledge allegiance and accept their lower position. Gift-making thus appears as a sort of demonstrative expenditure, a kind of legitimizing self-affirmation through which power makes itself known and recognized. It awards itself a rudimentary form of institutionalization by making itself official (Bourdieu, 1990; 125, 131). If gifts are repeated more or less regularly, power can be maintained in this political war for rank, distinction and pre-eminence.³

We can now shift our attention to the most relevant economic literature. Recently, economists have explored the motives susceptible of explaining charitable transfers and voluntary contributions to public goods. Essentially, they depict a gift-giver as deriving utility directly from an act of unselfish behavior. For example, there is the “warm glow” effect first highlighted by Andreoni (1990) and according to which donors feel good about themselves. Another motivation worked out by Harbaugh (1998a,b), and closer to our interest in this paper, is social prestige as determined by reported gifts: it depends on the size of the audience, or the number of witnesses.⁴ When discussing patron–client relationships, economists have sometimes alluded to the possibility of selfish, status- or power-based motivations behind generous behavior. Patrons may thus choose to enter and stay into a pooling arrangement from which they do not apparently draw benefits comparable to those obtainable under autarky (Fafchamps, 1992; Platteau, 1995b). Or, Big Men may not take the entire surplus in order to enhance their status and signal that they are generous persons (Fremling and Posner, 1999). In these works, however, trading of consumption for status appears only on the side of the gift-giver: the social shame experienced by the gift-receiver, and the fact that the gift may be used to establish or confirm hierarchical relations, are overlooked.⁵

In a pioneer paper, Holländer (1990) considers the possibility of both positive and negative social approval in the context of a public good provision problem. In this setup, agents enjoy the gratitude and sympathy of others if they happen to have contributed an above-average effort to the production of the public good. In the converse case where their contribution is comparatively small, they suffer from a negative approval effect. As for Gaspard and Seki (2003) and Platteau and Seki (2007), they have explicitly modeled the two-way effects of unilateral transfers on self-esteem in the specific context of an income-pooling scheme with agents of different abilities exploiting a common property resource. While the former attempt to discover the conditions related to the operation of the esteem factor under which the effort equilibrium levels obtained under the scheme are identical to the first-best levels (bear in mind that, owing to the presence of externalities, decentralized effort decisions cannot achieve first-best efficiency in the absence of social esteem), the latter examine the conditions under which agents would prefer to pool incomes under an equal division rule, and experience the associated esteem effects, to remaining autarkic and avoiding such effects. One of the central interests of van de Ven (2002), on the other hand, is to explain the existence of reciprocal gifts. Instead of looking for the kind of motivations commonly used in the economic literature (see *supra*, Section 1), he explains gift-giving by a demand for social approval and conceives reciprocal gift-giving as an instrument in the race for status. However, he does not characterize the associated equilibrium and, therefore, we can never be certain that a gift made will be accepted in the assumed presence of social shame.

In contrast, the present attempt does not aim at explaining reciprocal gifts since we want to understand states characterized by permanent power and status asymmetries. It is true that such states could be viewed as the end outcomes of a series of rounds in which the agents make gifts and counter-gifts. However, we have chosen not to follow this path in order to concentrate our attention on the issue of feasibility of asymmetric states and the precise conditions under which they may obtain.

Compared to Platteau and Seki (2007), we want to build a more general framework in the three following senses. First, the amount of the transfer is endogenized rather than being fixed by a predetermined rule. Second, the sensitivities to social esteem and shame are left free to vary between the agents. And, third, the social esteem function is not restricted to a linear form. Unlike what is done in Gaspard and Seki (2003), we are not interested in comparing the equilibrium obtained under a

³ By contrast: ‘In place of the relationships between persons indissociable (non separable) from the functions they fulfill, which they can perpetuate only at direct personal cost, institutionalization sets up strictly established, legally guaranteed relations between recognized positions, defined by their rank in a relatively autonomous space, distinct from and independent of their actual and potential occupants...’ (Bourdieu, 1990; 131).

⁴ As pointed out by Fessler (2001) on the basis of experimental psychological evidence, there is a positive relationship between the esteem coefficients and the number of witnesses: “the intensity of shame or pride experienced is in part contingent on the audience present” (p. 201). This is true, however, only if the number of witnesses belong to the reference group of the donors and donees: an agent can obtain positive or negative approval from people who know his behavior only if the latter are able, in one way or another, to communicate their feelings to him (Holländer, 1990 p. 1159). Likewise, Ekeh alludes to the importance of the audience when he points out that “a generous wealthy kinsman may receive his reward in the amount of honour he acquires from the elite kinship dominion” (2004; 35).

⁵ For an up-to-date survey of the variety of motivations underlying acts of giving, altruism, and reciprocity, see Kolm and Ythier (2006, vol.1), especially chapters 1, 2, 3 and 6.

transfer scheme with the first-best efficient equilibrium, but in comparing it with autarky.⁶ Moreover, in the situation which we are going to examine, there is no pooling of incomes so that the question as to whether social esteem considerations can possibly mitigate the moral hazard in team problem does not arise.

Before describing our model in detail, we need to emphasize that we do not want to describe the precise mechanics of power, which would require us to specify the medium and long-term advantages obtained by the donor through subordination of the donee. We do not either explore the intricacies of the bi-directional relationship between social status and power such as they have been discussed in the sociological literature, for example by Lovaglia et al. (2003). Instead, we concentrate upon the task of exploring the conditions under which a power relationship can be endogenously formed in a one-period game-theoretic framework. This narrowing down of the problem is warranted in our specific context since instantaneous trading takes place between the donor/patron and the donee/client: both agents give something and receive something else as an immediate return to their giving gesture. We thus depart from a dynamic framework in which a gift today is being reciprocated at a later date, as typically assumed in the aforementioned economic literature on reciprocal transfers. In such an instance, the deal follows the logic of either credit or insurance, and it is not clear how the dimension of power as we understand it here is present.

3. The model: setup and main results

3.1. The setup of the model

3.1.1. Informational assumptions and structure of the game

Two individuals choose their optimal level of labor effort which is the unique, and costly input in the production of a consumption good. The agents are endowed with different productivities. The production function is atomistic (no production pooling is possible across the two agents) and linear in the effort invested, and the effort cost function is convex. Each agent derives a positive utility from the total amount produced and consumed, and a disutility from working. We assume that only one agent has the ability to make a gift that the other agent can either accept or refuse.

Since we are interested in determining the conditions of feasibility of asymmetric exchange, it is essential that our model allows for gift refusals. In other words, it must be possible to account for real world stories of families and individuals stubbornly choosing to remain outside of patronage networks or power games, or unwilling to endure subordination when the cost is too high (Colin, 2004). As noted by Eric Posner (2000), “In order to avoid losing status, even donees in great need will sometimes refuse to accept charity, or will insist that the charity be hidden, or will attempt to reciprocate after receiving charity – all of these are favorite subjects of Victorian novelists” (p. 58). It is also important to account for the attitude of countries such as China and India whose self-esteem is sufficiently high to make them refuse aid offers made by rich countries (we will return to this example in the final section of the paper).

The first explanation that springs to mind to account for gift refusal rests on the idea of imperfect information: a patron makes a gift offer to an individual whose characteristics, only imperfectly known to the patron, drive him to reject it: rejection then arises out of the patron’s ignorance. Such an explanation, however, is not satisfactory in so far as in traditional set-ups where patron–client relationships typically arise highly interpersonal relations dominate and information is widely shared among community members. Under conditions of perfect information (potential patrons and potential clients have a perfect knowledge of their mutual characteristics as embodied in their utility functions), a sequence of the game in which the potential recipient is allowed to reject the gift offer in the last step will never yield gift refusal as a possible outcome. Indeed, since the patron knows the characteristics of the potential donee, he would adjust the amount of the gift so as to make it acceptable to the latter. And if any such adjustment would make the potential patron worse off than under a situation of autarky, the patron would then refrain from proposing the gift.

With perfect information, therefore, a gift offer may be unacceptable to some individuals and patron–client relationships may not be automatically established, only if potential clients do not have the possibility of rebuttal *after* a gift proposal has been made. It could be objected that a willing gift-maker would suffer shame and humiliation if faced with a rejection of his proposal (see e.g. Bourdieu (1990) on the exchange of honour). To avoid this difficulty, we assume that gift refusal does not actually take place, but remains implicit in the following sense. Being perfectly informed, the patron does not address himself to someone whom he knows has too much pride to accept the optimal gift he would like to make. To sum up, we do not model gift refusal as such, but our framework allows for failed patron–client relationships. When a potential donor actually enters into a relationship with a potential donee, a gift exchange necessarily takes place because the parties to this exchange have personal characteristics that make it feasible. These characteristics can thus be determined.

In the light of the above considerations, we use a sequential, four-step game in which the donor is the first mover and the possibility of gift refusal does not take place in the final stage of the game. In the first step, the potential patron chooses the individual to whom he is going to make a gift offer. In the second step, the potential donee decides whether he accepts or rejects the offer. In the third step, the donee decides his amount of effort, and in the fourth step the potential donor simultaneously chooses his consumption level and the amount of the gift. Solving this game by backward induction will yield an outcome in which the potential donee will accept the gift offer at equilibrium. When an individual remains outside

⁶ In Gaspart and Seki (2003), the amount of the transfer is chosen by the central planner, sensitivity parameters are not identical, and the social esteem function is assumed to be linear.

the sphere of patron–client relationships, we define him as being autarkic (his consumption is entirely derived from his own production effort).

3.1.2. The social esteem function

The specification of the social esteem function requires some discussion. There are two possible approaches. First, we have the conventional approach under which the amount of social esteem or shame experienced by the agent is proportional to the absolute value of the gift given or received. In the second approach, social esteem or shame is a function of the size of the gift relative to the recipient's total consumption. We believe that the second approach is more appropriate to describe situations in which power is at stake: the larger the gift in relation to the donee's consumption, the higher the degree of his dependence on the donor, and the stronger the power afforded by the donor. Upon this understanding, even a gift of small (absolute) value might give rise to a lot of power if it constitutes a substantial portion of the recipient's consumption.

It bears emphasis that the conventional approach to gift-giving is actually devoid of any element of strategic interactions: the effort of the potential donee does not depend on the value of the gift because it does not affect the esteem value of that gift for the donor. This is in contrast to the second approach, favored in this paper, in which the impact of a gift on the social esteem component of the utility of both agents varies with the level of the recipient's effort. Therefore, our utility function, which is assumed to be additive, has three components: the direct effect of own effort, the effort cost, and social esteem (or power) assumed to depend on the weight of the gift in the recipient's consumption. It has the following general form for our two agents i and j , where i is assumed to have the ability to make a gift that j can either accept or refuse:

$$U^i = \tau y(x^i; \alpha^i) - c(x^i) + E(e^i, (1 - \tau)y(x^i; \alpha^i), y(x^j; \alpha^j)) \quad (1)$$

$$U^j = y(x^j; \alpha^j) - c(x^j) + (1 - \tau)y(x^i; \alpha^i) - E(e^j, (1 - \tau)y(x^i; \alpha^i), y(x^j; \alpha^j)) \quad (2)$$

where $y(\cdot)$, $c(\cdot)$, and $E(\cdot)$ are the production, cost, and esteem functions; x^i and x^j are the effort levels of agents i and j , respectively; e^i and e^j are parameters measuring the importance attached to social esteem/shame by agents i and j ; α^i and α^j are their respective productivity parameters; τ is the rate of retention of income by agent i , implying that $(1 - \tau)$ is the proportion of income earmarked for the gift to agent j . The amount of the gift is denoted by $g = (1 - \tau)y(x^i; \alpha^i)$. The production function is assumed to be concave, and the cost function to be convex: $y(\cdot)' > 0$, $y(\cdot)'' < 0$, $c(\cdot)' > 0$, $c(\cdot)'' > 0$.

The behavior of the esteem function is a critical and delicate matter that needs to be clarified. This function has three components: the sensitivity to esteem/shame of the agent concerned, the amount of the transfer from i to j , and the amount of output produced by j since we have assumed that esteem/shame or power/subordination varies with the level of j 's dependence on i . Since j experiences shame, or suffers from subordination, when he receives and accepts a gift from i , the esteem effect in his utility function is associated with a negative sign. The first-order derivatives for the esteem functions of both i and j are straightforward: the esteem effect increases with sensitivity to esteem and the amount of the gift, but it decreases with the level of output of the potential gift receiver, j . Formally, we write: $E_e > 0$, $E_g > 0$, and $E_{y(x^j)} < 0$. As for the second-order derivatives, it is reasonable to assume that the esteem function is concave in both the esteem parameter and the amount of the gift, while being convex in the potential client's output. Esteem is thus treated as a standard good subject to saturation. Formally: $E_{ee} < 0$, $E_{gg} < 0$, $E_{y(x^j)y(x^j)} > 0$. Less straightforward is the determination of the signs of the cross-derivatives, which will determine our comparative static results. We assume that: $E_{eg} > 0$, $E_{ey(x^j)} < 0$, $E_{gy(x^j)} < 0$. Let us first comment on the sign of the third cross-derivative. Bear in mind that in our understanding i 's prestige depends positively on j 's dependence on his generosity. Consistent with this assumption the gift made by i and the effort applied by j are conceived as substitutes: if j increases his output by one unit, thereby reducing his dependence on i 's benevolence, the esteem effect of a marginal increase in the gift made by i decreases. We follow the same logic of reasoning, by analogy, when deciding upon the signs of the other two cross-derivatives. Thus, sensitivity to social esteem plays the same role as the gift so that these two components of the esteem function can be seen as complements: the esteem effect of a marginal increase in the gift is stronger when the agent is more sensitive to esteem. Formally, the effect of a marginal increase in the sensitivity parameter on $\partial E/\partial g$ is positive. On the other hand, the impact on esteem (in absolute terms) of a marginal change in the recipient's production (effort) rises with the agent's sensitivity to esteem. Formally, the effect of a marginal increase in the sensitivity parameter on $\partial E/\partial y(x^j)$ is negative, where $\partial E/\partial y(x^j) < 0$.

3.2. Analytical results

3.2.1. A necessary condition for the existence of asymmetric gift exchange

We solve the problem backwardly. The maximization problem of player i , the potential gift-maker is given by:

$$\text{Max}_{x^i, \tau} \quad \{\tau y(x^i; \alpha^i) - c(x^i) + E(e^i, (1 - \tau)y(x^i; \alpha^i), y(x^j; \alpha^j))\} \quad (3)$$

$$\text{s.t.} \quad 0 \leq \tau \leq 1 \quad (4)$$

This problem has an interior solution (see Appendix A.1). Combining the two first-order conditions, and assuming that the constraint is not binding, we obtain:

$$E_g^i = 1 \quad (5)$$

$$y_{x^i}^i = c_{x^i}^i \quad (6)$$

where to simplify notation, the upper scripts i and j attached to the functions $y(\cdot)$, $c(\cdot)$, and $E(\cdot)$ refer to the identity of the agent concerned.

The two above equations express in an implicit manner the reaction of agent i , in terms of production and its allocation between own consumption and gift, to any production level of agent j . Eq. (5) depicts the share of his own production that i wants to transfer to j for all levels of j 's output. Its interpretation is straightforward: the equilibrium amount of the gift (if it is made) is such that its marginal impact on i 's esteem is equal to the marginal cost in terms of foregone consumption (which is equal to 1). As for Eq. (6), it determines the optimal output for player i , which must satisfy the standard condition of equality between marginal productivity and marginal cost of effort. It implies, in particular, that the optimal effort of the potential donor is independent of the donee's characteristics, and is therefore the same as in the autarkic situation.

The problem of the recipient, j , can be written thus:

$$\text{Max}_{x^j} \{y(x^j; \alpha^j) - c(x^j) + (1 - \tau)y(x^i; \alpha^i) - E(e^i, (1 - \tau)y(x^i; \alpha^i), y(x^j; \alpha^j))\} \tag{7}$$

$$\tau = \tau(x^j) \quad \text{as given by (5)} \tag{8}$$

Under plausible assumptions detailed in the Appendix, j 's maximization problem has an interior solution, and we denote by x^j_0 the optimal effort applied by agent j (x^j_0 , by contrast, represents j 's effort under autarky). It is implicitly defined by the following equation:

$$\Rightarrow y^j_{x^j} [1 - E^j_{y^j} - \tau_{y^j} y^i + \tau_{y^j} y^i E^j_g] = c^j_{x^j} \tag{9}$$

The equilibrium condition for j shows that, except by coincidence, the marginal productivity of his effort will not be equal to the marginal cost such as happens under autarky. The terms featuring between brackets reflect four different effects. The first effect is simply the marginal benefit obtained by j from increasing his effort by one unit. The second effect, reflected by $E^j_{y^j}$, depicts another benefit that results from the mitigation of social shame that j achieves by increasing his output. The last two effects cannot be signed until we know how the gift made by i responds to an increase in the output produced by j . It is actually easy to compute the first partial derivative of τ with respect to y^j from (5): $\frac{\partial \tau}{\partial y^j} = \frac{E^i_{g y^j}}{E^i_{g g} y^i} > 0 \Rightarrow \frac{\partial g}{\partial x^j} = -\frac{E^i_{g y^j} y^j}{E^i_{g g}} < 0$. The third effect now appears to be a loss caused by the decrease in the amount of the gift made by i as a result of j 's increased effort. As for the last term in the expression between brackets, it represents a new benefit arising from the mitigation of social shame: this time the reduction of shame is caused by the induced reduction of i 's gift. Shame is thus mitigated because j 's dependence on i has been reduced on a double score: through the increase in j 's output (the direct effect), and through the decrease in i 's gift (the indirect effect triggered by the direct one).

Using (5), Eq. (9) can be re-written as:

$$\Rightarrow y^j_{x^j} [1 - E^j_{y^j} - (E^i_g - E^j_g) \tau_{y^j} y^i] = c^j_{x^j} \tag{10}$$

From this new expression, it is evident that if $E^i_g < E^j_g$, the expression between brackets is necessarily greater than one. As a consequence, the marginal productivity of j 's effort is smaller than its marginal cost at equilibrium, implying that j puts in a supra-optimal level of effort, or an effort higher than that applied under autarky (where $y^j_{x^j} = c^j_{x^j}$). This situation reflects the overriding importance of the shame mitigation effects. If $E^i_g > E^j_g$, on the other hand, it is impossible to predict *a priori* whether the expression in brackets will be higher or smaller than one because the second and the third terms now have opposite signs. It can be easily shown, however, that the case in which $E^i_g < E^j_g$ is incompatible with an asymmetric exchange.

Proof. We begin by re-writing the players' utilities as:

$$U^i = y(x^i, \alpha^i) - c(x^i) + [E(e^i, (1 - \tau)y(x^i), y(x^j)) - (1 - \tau)y(x^i)]$$

$$U^j = y(x^j, \alpha^j) - c(x^j) + [(1 - \tau)y(x^i) - E(e^j, (1 - \tau)y(x^i), y(x^j))]$$

Being the outcome of voluntary trading, the asymmetric exchange is by definition Pareto superior to autarky. The following inequality must therefore hold:

$$E(e^i, (1 - \tau)y(x^i), y(x^j)) > (1 - \tau)y(x^i)$$

$$(1 - \tau)y(x^i) > E(e^j, (1 - \tau)y(x^i), y(x^j))$$

These conditions follow from the fact that under autarky agents i and j are able to guarantee for themselves $y(x^i, \alpha^i) - c(x^i)$ and $y(x^j, \alpha^j) - c(x^j)$, respectively. Combining these two conditions, we have that:

$$E(e^i, (1 - \tau)y(x^i), y(x^j)) > (1 - \tau)y(x^i) > E(e^j, (1 - \tau)y(x^i), y(x^j))$$

Since $E_e > 0$, we can conclude that $e^i > e^j$. □

It bears noticing that the above inequality conditions, whether expressed in terms of the $E(\cdot)$ functions, or the sensitivity parameters, hold irrespective of the values of α^i and α^j . In particular, however high is the productivity of i , and however low is the productivity of j , an asymmetric exchange relationship is impossible if $e^j > e^i$.

We thus write the following proposition:

Proposition 1. *When the utility function is additive in its components, an asymmetric exchange relationship in which income is traded against social esteem or political power, can be established only if sensitivity to social shame (or the cost of subordination) of the potential gift-receiver is smaller than sensitivity to social esteem (or the advantage of power as perceived by him) of the potential gift-giver. The respective values of the two agents' productivities cannot influence this result.*

The condition $e^j < e^i$ for the feasibility of a gift from i to j evidently implies that reciprocal gifts are impossible in our framework. Indeed, the condition for the feasibility of a gift from j to i is, by analogy, $e^i < e^j$, which is obviously incompatible with $e^j < e^i$.

The intuition behind the result stated in Proposition 1, as well as the reason why it hinges upon the assumptions of additive utilities will soon become clearer.

3.2.2. Comparative statics: the determinants of the amount of the gift

How the amount of gift made by i changes with e^i , e^j , α^i , and α^j is the next question that we address. These effects can be signed unambiguously (see Appendix A.2 for the proofs):

$$\frac{\partial g}{\partial e^i} > 0, \quad \frac{\partial g}{\partial e^j} < 0, \quad \frac{\partial g}{\partial \alpha^i} = 0, \quad \frac{\partial g}{\partial \alpha^j} < 0$$

When the donor is more sensitive to social esteem or power, he is inclined to increase the amount of the gift offered to the recipient. When the recipient is more sensitive to social shame or subordination, he raises his effort level as a result of which the gift made by the donor is reduced. When the donor is more productive, the gift remains constant. On the other hand, when the productivity of the recipient is higher, he reacts by increasing his output (the effect on his amount of effort is indeterminate), and the donor is induced to cut down his gift.

The two results concerning the impact of the sensitivity parameters conform with intuition. The same can be said of the impact of a change in j 's productivity on the equilibrium amount of the gift. The effect of a change in i 's productivity, however, needs some explanation. First note that when i 's productivity is higher, the proportion of his income allocated to the gift diminishes ($\partial \tau / \partial \alpha^i > 0$). Yet, his effort, and therefore his income, increase enough to make the absolute amount of the gift constant, a conclusion which directly follows from the equilibrium condition (5). Indeed, since for a constant gift the marginal benefit in terms of esteem, E_g^i , is unaffected by a change in α^i (and in x^i or y^i), while the marginal (opportunity) cost is always equal to one, the amount of the gift must stay constant. The linearity of the consumption component of the utility function actually drives this result.

3.2.3. Establishing the conditions for parasitic behavior

Asking whether parasitic behavior can occur is asking whether the effort applied by the gift recipient is reduced compared to a situation of autarky. Before tackling this question, we need to elucidate how the effort applied by the gift recipient varies with the different parameters of the model under conditions of asymmetric exchange. Let us therefore consider the way the effort applied by j is affected by e^i , e^j , α^i , and α^j . The results are as follows (see again Appendix A.2 for the proofs):

$$\frac{\partial x^j}{\partial e^i} \leq 0, \quad \frac{\partial x^j}{\partial e^j} > 0, \quad \frac{\partial x^j}{\partial \alpha^i} = 0, \quad \frac{\partial x^j}{\partial \alpha^j} \leq 0$$

An increase in j 's sensitivity to social shame prompts him to exert more effort in order to mitigate it. However, an increase in i 's sensitivity to social esteem has an undetermined impact on j 's effort. In fact, the sign of $\partial x^j / \partial e^i$ entirely depends on the sign of $(E_{gy}^j - E_{\alpha}^i)$: $E_{gy}^j \geq E_{\alpha}^i \iff \partial x^j / \partial e^i \geq 0$. In words, if the marginal impact of the gift on j 's shame is more responsive to a change in j 's effort than to a change in the amount of the gift itself, then j responds to an increase in i 's sensitivity to esteem by raising his level of effort. The effect of an increase in α^i on x^j is nil because, as we have seen above, the amount of the gift is independent of α^i . Finally, the effect of a change in α^j on x^j turns out to be quite complex and cannot be determined.

We are now in a position to elucidate the conditions of parasitism. Formally, parasitism occurs if $x_j^o < x_j^a$, which is equivalent to the condition requiring that the square bracketed term in (10) is smaller than 1. It is evident that this condition is satisfied if the difference between E_g^i and E_g^j is high and/or E_y^j is small.

Further analytical results can be easily obtained (see Appendix A.3):

$$\frac{\partial(x_j^o - x_j^a)}{\partial e^i} > 0, \quad \frac{\partial(x_j^o - x_j^a)}{\partial \alpha^j} < 0$$

In words, greater sensitivity to social shame induces the donee/client to increase his effort relative to the autarkic situation. Contrariwise, higher own productivity induces him to reduce his effort. These results are according to expectation: while the first circumstance prompts the donee to mitigate social shame by reducing his dependence vis-à-vis the donor, the second circumstance prompts him to increase his effort to a larger extent under autarky than under asymmetric exchange.

We can also determine the effect on the donee's effort level of a change in the donor's sensitivity to social prestige:

$$\frac{\partial(x_j^o - x_j^a)}{\partial e^i} \leq 0 \iff E_{y^jg}^j \geq E_{gg}^j$$

Greater sensitivity of the donor to social prestige thus induces the donee to relax his effort (compared to autarky) when the second-order cross-derivative $E_{y^j g}^i$ is higher than the second-order derivative $E_{g g}^i$. Given the concavity of the utility function, and bearing in mind the above result that $g_{y^j} < 0$, the result implies that parasitic behavior is induced for high values of the donee's effort associated to low values of the gift. This is again according to intuition: when the donor attaches great weight to social esteem and is therefore predisposed to distribute favors, the donee is tempted to relax his effort provided that his dependence on the donor is not too large, which is certain to happen for initially low values of the gift.

Proposition 2 summarizes the above results.

Proposition 2. *Parasitic behavior understood as a relaxation of effort on the part of a gift recipient is a distinct possibility when social esteem or status considerations are at play. Observing this behavior is more likely when the donee's sensitivity to social shame is low, when his productivity is high, or when the donor is sufficiently sensitive to social esteem (provided that the initial level of the donee's effort is sufficiently high).*

In the light of Proposition 2, the intuition behind Proposition 1 also becomes clearer. When the potential gift recipient is more sensitive to esteem/shame than the potential donor, he exerts a large amount of effort (more than he does under autarky) because he is eager to mitigate social shame, or to reduce subordination. His reaction has the effect of diminishing his rate of dependence on the potential donor, thereby reducing the esteem value of gift-making, so much so that the latter is no more interested in making a transfer in favor of the former. Asymmetric exchange may only occur if the potential recipient is less sensitive to esteem than the potential donor. This result, however, requires the specific assumption of additive utilities to hold true. Assume, for instance, that consumption and social esteem are substitutes instead of being independent. In this case, the utility loss caused by the transfer will be less for a given level of sensitivity to social shame. Therefore, the recipient does not need to mitigate social shame by increasing his effort as much as when his consumption and social esteem are independent arguments of his utility function. As a consequence, his degree of dependence on the donor is also higher so that the latter's utility is reduced to a smaller extent, other things being equal.

3.2.4. Conditions for the feasibility of gift exchange

Using backward induction, we can now analyze the conditions for gift-making and acceptability. We jointly treat the two conditions, although the game is played sequentially and solved as such. When e^i increases, it can be shown that the benefit that the donor reaps by making a gift diminishes compared to a situation of autarky: the condition for gift-making becomes tighter. Under the same circumstance, j 's utility gain from accepting a gift is reduced: the condition for gift acceptability also becomes tighter (see Appendix A.4). On both counts, the feasibility of asymmetric exchange is made more difficult. This result does not require additional explanation since it is directly linked to the condition $e^j < e^i$. As for the impact of an increase in e^i on the two conditions, it is indeterminate. Yet, it is possible to show that if j 's output decreases when the gift is greater, the gain for i of making a gift compared to autarky is certain to increase. This is because j 's dependence on i has increased in this case.

When α^i rises, there is no impact on the gift-making condition (this is expected since in this case the gift amount is not affected), and there is no impact either on the gift acceptability condition. On the other hand, when α^j increases, the gain from making a gift for i decreases monotonically since j 's cost of keeping down his dependence on i has fallen. This can be shown formally. The donor/patron is willing to make a gift if $C^m = E^i - (1 - \tau)y^j > 0$. The effect of a change in α^j on this condition is:

$$\frac{dC^m}{d\alpha^j} = -E_{y^j}^i \tau_{y^j} y^j + E_{y^j}^i y^j + \tau_{y^j} y^j y^j = [E_{y^j}^i + \tau_{y^j} y^j (1 - E_g^i)] y^j = E_{y^j}^i y^j \text{ since } E_g^i = 1 \text{ at equilibrium}$$

The sign of this expression is negative as $E_{y^j}^i < 0$. Because there exists a finite value of y^j such that $\tau = 1$, it follows that there exists an α^j above which $C^m = E(0, y^j, e^i) = 0$. Therefore, for high productivity levels of the recipient, no gift is made.

Turning to the gift acceptability condition, it can be written as $C^a = (1 - \tau)y^i - E^j > 0$. Taking the first derivative with respect to α^j yields:

$$\frac{dC^a}{d\alpha^j} = y^j [-E_{y^j}^j - \tau_{y^j} y^j (1 - E_g^j)] \tag{11}$$

Note the parallelism between the above square bracketed term, and the square bracketed term in the expression (10): the latter is strictly equal the former plus one. This means that the gift acceptability condition hinges upon the effort response of the recipient compared to the autarkic situation. We know from our above comparative statics that the possibility of parasitic behavior increases with α^j , which implies that the value of the squared bracketed term in (11) monotonically decreases when α^j increases. When α^j is smaller than a critical value corresponding to the threshold above which the amount of the gift made by i starts to decrease, the value of $dC^a/d\alpha^j$ is positive (see Appendix A.4), implying that the condition of gift acceptance is gradually relaxed as α^j increases in this range. Moreover, if we make the additional assumption that the recipient of a positive gift incurs infinite social shame in the event that he does not produce any output on his own, that is, if $E(e^j, g(0), 0)$ tends to an infinitely negative value, the gift is certain to be refused for sufficiently low values of α^j .⁷ Since, on the other hand, we already know that no gift will be offered by the potential donor if the productivity of the potential donee is sufficiently high, we can also state that no asymmetric exchange will take place for high values of α^j .

⁷ When $\alpha^j \rightarrow 0$, and $\lim_{y^j \rightarrow 0} E(e^j, g(y^j(\alpha^j; \alpha^i)), y^j(\alpha^j; \alpha^i)) = -\infty$, $\lim_{y^j \rightarrow 0} C^a = y^i - E(e^j, g(0), 0) < 0$.

Proposition 3 summarizes all the above results:

Proposition 3

- (a) When the recipient is more sensitive to social shame or subordination, he exerts more effort, thereby reducing the net gain of gift-making for the donor and, eventually, the net gain of gift acceptance for himself. Therefore, when an individual's sensitivity to shame becomes sufficiently high, asymmetric exchange becomes impossible. If, on the other hand, the donor's sensitivity to esteem or power is higher, he will have a stronger incentive to make a gift, provided that the recipient behaves as a parasite. Yet, the effect of this change on the gift acceptability condition cannot be determined.
- (b) If the productivity of the recipient is either too high or too low, asymmetric exchange is impossible. In the former case the recipient does not accept a gift, while in the latter case it is the donor who refuses to make it.

4. An illustration

In this section, we use a specific functional form for the utility function of the two agents and resort to simulation. This is with a view to better visualizing the working of the gift-making and acceptability conditions, and the manner in which the central parameters of the model interact with each other. The form adopted for the utility functions is:

$$U_i(x^i, t^i) = \alpha^i x^i - \beta^i (x^i + t^i)^2 + e^i \left[\left(\frac{\alpha^i x^i + \alpha^i t^i}{\alpha^i x^i} \right)^\gamma - 1 \right] \quad (12)$$

$$U^j(x^j) = \alpha^j x^j - \beta^j (x^j)^2 + \alpha^i t^i - e^i \left[\left(\frac{\alpha^i x^i + \alpha^i t^i}{\alpha^i x^i} \right)^\gamma - 1 \right] \quad (13)$$

As before, the production function is linear in the effort applied and the effort cost function is convex. Moreover, the esteem function is written in such a way that the amount of esteem, or shame, is proportional to j 's rate of dependence on i through the gift. This rate of dependence is measured by the percentage by which the gift made by i increases j 's income. It is for the commodity of computation that we avoid using the more straightforward measure of dependence as the proportion of i 's gift in j 's total income. Note also that the amount of the gift is written as $\alpha^i t^i$, where t^i is the time allocated by i to produce the gift. As a result, x^i must now be interpreted as the time devoted by i to produce for his own consumption. It bears emphasis that the results of the model are not affected by this way of writing the gift. Finally, the parameter γ determines the shape of the esteem function. In the following discussion γ is assumed to equal 1/2 so that the esteem function is concave (technical details and proofs regarding this specific model are available from the authors upon request).

Denoting $\varphi = e^i/X$, $X = (\alpha^j)^2/\beta^j$, and $\kappa = e^i/e^j$, the conditions of gift-making for i and gift acceptability for j can be written, respectively, as follows:

$$\varphi \geq 2\kappa - 1 \quad (14)$$

$$4\kappa\varphi - 3\varphi^{4/3}(2\kappa - 1)^{2/3} - 1 \geq 0 \quad (15)$$

In order for these two conditions to be simultaneously verified, it can be shown that κ may not exceed 1, implying that $e^j \leq e^i$. We thus confirm the result stated in Proposition 1.

Let us examine the trade-off between esteem and productivity parameters, bearing in mind that X is a proxy for j 's productivity (β^j is the parameter of j 's cost function), and κ measures relative sensitivities to social esteem/shame. To define the gift feasibility domain through simulation, we first set the value of e^i and then proceed by varying the X and κ parameters.

The condition for gift-making by agent i is depicted by the dark shaded area in Fig. 1. We verify that a gift is more likely to be made by i when j is less sensitive to social shame, and/or j 's productivity is lower (or his effort cost is higher).

In Fig. 2, the dark-shaded area depicts the domain of (X, κ) values within which the gift is accepted by agent j , assuming that $e^i = 10$. This domain is made of two triangle-like areas which touch each other at their summits, with one of them having an inverted form. Looking at the lower triangle, it appears that when the potential donee is more sensitive to social shame (higher values of κ) he is less likely to accept the gift. For a given, sufficiently low value of e^j ($\kappa < 1$), j 's inducement to accept the gift increases with his own productivity, yet only up-to a certain point beyond which his inducement starts to decrease. Ultimately, the gift is refused. Bear in mind that an increase in the productivity of j implies that, all other things being equal, his degree of dependence on i 's generosity is lower and, therefore, the cost of a gift in terms of loss of esteem is smaller. Above a certain threshold, however, the productivity of j becomes so large that he prefers to remain autarkic. When productivity is large, indeed, the amount of the gift is low because its esteem value for the donor is small.

Less obvious is the situation described by the upper, inverted, triangle. As the weight put on social shame increases above a certain threshold, which is in the neighborhood of 1 ($e^i = e^j$), the prospect of acceptance of the gift by j improves provided that his effort productivity is moderately high, yet not too high (or his cost of effort is moderately low, yet not too low). The idea is that, when shame significantly affects the utility of j , he is very keen to reduce his dependence *vis-à-vis* i , and this implies that he puts in a good amount of effort. The (moderate) gift made by agent i will then be acceptable to him. If, on

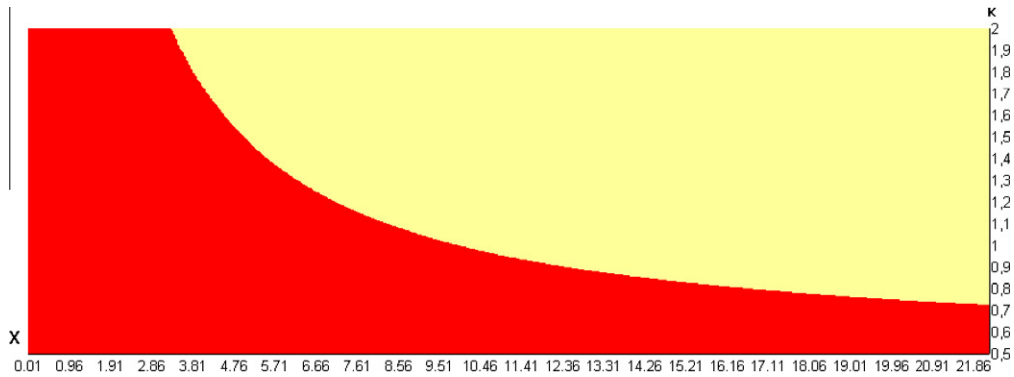


Fig. 1. Gift-making condition ($e^i = 10$).

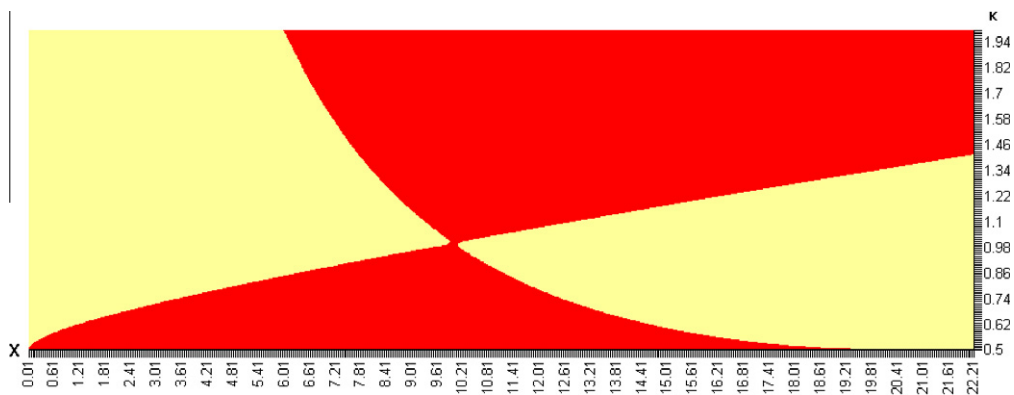


Fig. 2. Gift acceptability condition ($e^i = 10$).

the other hand, productivity of j 's effort is below a minimum level that varies with κ , autarky is preferable to j since diminishing dependence vis-a-vis i becomes too costly in terms of effort. Likewise, above a certain level of productivity, j wants to avoid social shame altogether, and he therefore refuses the (small) gift that would have been made by i (this effect nevertheless vanishes once κ becomes large enough).

When the two feasibility areas are superimposed on each other, we obtain Fig. 3. The striking feature is that the upper triangle in Fig. 2, which describes the condition for gift acceptability by j , has vanished, reflecting the feasibility condition $e^j < e^i$. Within this feasibility domain, an asymmetric exchange may yet be impossible if the productivity of j is either too low or too high. When j is sensitive enough to social shame, he responds by putting in a lot of effort so as to maintain his

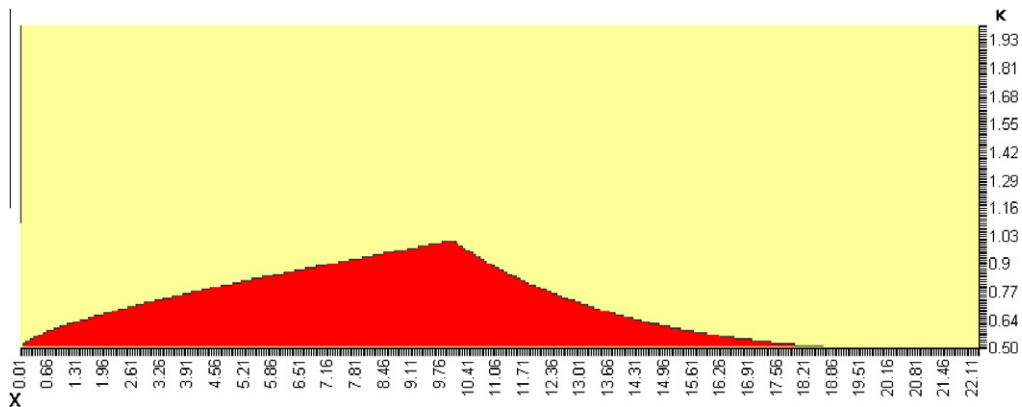


Fig. 3. Feasibility of asymmetric gift exchange ($e^i = 10$).

degree of dependence within tolerable bounds and mitigate the effect of shame. If his productivity is relatively high, he would be able to reduce his dependence so much that the rising cost of making a gift for agent i would discourage him from making a gift. If, on the other hand, the recipient's productivity is relatively low, the small gift proposed by agent i ceases to be attractive and agent j prefers autarky (see Proposition 3 above). From the special shape of the feasibility domain in Fig. 2, it is evident that the above condition is all the more constraining as j 's sensitivity to social shame gets closer to i 's sensitivity to social prestige or power.

What happens if the donor's esteem coefficient, e^i , is modified parametrically? When the value of e^i is reduced, we find that the shape of the feasibility domain remains broadly similar to the one shown in Fig. 3, but the domain shifts leftwards and its size is reduced. This implies that lower values of the recipient's productivity are susceptible of inducing him to accept the gift. The rationale is the following: when the donor is not very sensitive to social esteem or power, he will make a rather small gift yet, if the recipient's productivity is low, this small gift will represent a large share of the latter's income and accepting it is profitable.

Our discussion highlighting the substitutability between the esteem and productivity coefficients suggests that asymmetric exchange could possibly occur between two agents of identical productivities (and effort costs). Just construct an example in which agents i and j have similar levels of effort productivity and cost ($(\alpha^i)^2/\beta^i = (\alpha^j)^2/\beta^j = 9$). Assuming that $\kappa = e^j/e^i = 0.6$ and $e^i = 10$, we find that the two conditions for the feasibility of asymmetric exchange, conditions (14) and (15), are satisfied. In fact, it is even possible that agent j has a (moderately) higher productivity than agent i to whom he subordinates himself.

This is an important result since the common view prevails that, for patronage to exist, there must be a dominating party, the patron, who is more productive than the dominated one, the client, typically because he is better endowed with wealth or productive resources. Our claim here is that a sufficiently large difference in social esteem coefficients may produce patronage even between individuals of identical abilities. In other words, a person can accept an inferior position on the social ladder only because of a rather low sensitivity to shame that a humble position entails. Of course such a situation corresponds to a particular case that arises only for specific configurations of the esteem and productivity parameters. Apparently, it can nevertheless occur in practice as attested by the following observation made by the African historian Cheikh Anta Diop: "Members of the superior caste who materially exploit members of the lower castes demean themselves and lose their social status in the eyes of the latter. They are actually expected to assist them in all sectors of life and even if they are less rich they must satisfy a request for help coming from a low caste client even at the cost of depriving themselves. In return, the beneficiary owes them moral respect." (Diop, 1982; 172 – our translation).

5. Conclusion

A central result obtained in this paper is that an asymmetric exchange equilibrium may only occur if the weight put on social shame by the recipient is smaller than that put on social esteem by the donor. Moreover, if this (necessary) condition is fulfilled, an asymmetric exchange will take place only if the recipient's productivity is neither too high nor too low. Note that we may encounter a special case in which the gift-giver has actually a lower productivity than the receiver. This requires that the former agent is highly sensitive to social prestige or power. Finally, the possibility of a parasitic response of the gift recipient is more likely to be observed when his sensitivity to social shame is low, when his productivity is high, or when the donor is sufficiently sensitive to social esteem (provided that the initial level of the recipient's effort is sufficiently high).

There is an interesting parallel between the above results and those obtained in Platteau and Seki (2007). In that paper, indeed, sensitivity to social esteem/shame, assumed to be identical for both agents, must exceed a minimum threshold if the most able agent is to agree to make a transfer and benefit from the associated local status effect, while it must not be too high lest the less able agent should prefer autarky to receiving the transfer and suffering from social shame.

Since our theory is framed in quite general terms, an interesting application can be made to aid relationships at the international level. We know from the available empirical evidence that the destination of bilateral aid flows can largely be explained by geopolitical considerations rather than by the characteristics of recipient countries that reflect need or strong absorption capacity (e.g., quality of governance). What is at work is a patronage logic whereby a dominating rich country provides aid to a poor, dominated country in exchange for the latter's allegiance or subordination. Allegiance may take the form of voting in tandem with the donor country at the UN general assembly, or promoting its strategic interests in various circumstances (Lundborg, 1998; Schraeder et al., 1998; Alesina and Dollar, 2000; Kuziemko and Werker, 2006; Berthelémy, 2007). Thus, the government of Kenya was rewarded by a new aid package (so far blocked by the US congress on account of a lack of respect for human rights and excessive corruption) when it came to openly express support for the US military intervention in Kuwait after this country was invaded by Iraq. Or, as long as she was an ally in the fight against Slobodan Milosevic, Montenegro knew that Western powers would leave its criminal networks (anchored in the business of cigarette smuggling and stolen cars) more or less untouched (Glenny, 2008).

A striking observation, however, is that not all developing countries enter into such patronage relationships with donor countries from the developed world. For some of them at least, in particular for big countries such as China and India, the cost of subordination seems to be too high to make them accept aid transfers (on a substantial scale). As convincingly argued

by Janos (1982), self-esteem considerations also operate at the level of nations. What must be added is that all countries are not equally self-conscious or sensitive to a sense of national pride which depends on their specific history and their experience in matters of foreign relations, in particular. The fact that countries which are today reluctant to enter into aid dependence relationships may not have displayed such a reluctance in the past (think of China during the 1950s and India during the 1960s) attests that other variables are at play. Among these other variables are the levels of poverty and the need for aid on the part of the laggard countries – China and India, in the immediate post-war period, were of course much poorer and less technologically developed than they are today –, which in our model are reflected in the productivity parameters. Of course, while esteem considerations may thus explain India and China’s refusal to accept aid, an important alternative view is that aid is not accepted for political economy reasons. For example, politically powerful domestic producers, particularly in the sectors of agriculture and clothing, may resist foreign aid because of the fear that it would result in reduced domestic demand for locally produced goods and services.

Another consideration, not allowed by our model, is the possible existence of competition among donor countries. India thus accepted large aid transfers from the United States and the Soviet Union partly because these two donor countries were rivalrous superpowers in the tense international context of the cold war. As a result, India did not become subordinated to either of them. By contrast, for ideological reasons, China accepted massive aid from the Soviet Union but no aid from the United States, as a result of which it became subordinated to the U.S.S.R. It is therefore not surprising that, after an escalating quarrel with its foreign benefactor, the aid relationship was disrupted in the summer of 1960 (Riskin, 1987, pp. 130–131).

Following the logic of our model, poor countries under continuous dependence *vis-à-vis* donor countries will produce less than they would under autarky if the cost of subordination is not acutely felt by them, and/or if some rich countries are sufficiently eager to secure a clientele in the developing world. Our theory thus provides a framework within which the perverse effects associated with the aid dependence syndrome can be understood. As the above-noted limitation of our model regarding the absence of donor competition suggests, however, there is need to develop a multi-agent framework in which several potential patrons and clients may interact. Developing such a framework should enable us to highlight the formation of various configurations of power and patronage depending on the initial composition of the population and on individual endowments.

Appendix A

A.1. Equilibrium existence conditions

The values of x^i and τ that set Eqs. (5) and (6) equal to zero are the argmax of U^i if player i ’s utility is concave in both variables. That this condition holds true becomes evident once we write the second-order derivatives of this utility with respect to x^i and τ , respectively:

$$\frac{\partial^2 U^i}{\partial x^i \partial x^i} = \tau y_{x^i x^i} - c_{x^i x^i} + E_g^i (1 - \tau) y_{x^i x^i} + E_{gg}^i (y_{x^i}^i (1 - \tau))^2 < 0$$

$$\frac{\partial^2 U^i}{\partial \tau \partial \tau} = (y^i)^2 E_{gg}^i < 0$$

Let us now look at the second-order condition (with respect to x^j) for agent j :

$$\frac{\partial (U^j)^2}{\partial x^j \partial x^j} = y_{x^j x^j}^j \left[1 - E_{y^j}^j - (1 - E_g^j) \tau_{y^j y^j} \right] + y_{x^j}^j y_{x_j}^j \left(2E_{y^j g}^j \tau_{y^j y^j} - E_{y^j y^j} - E_{gg}^j (\tau_{y^j y^j})^2 - (1 - E_g^j) \tau_{y^j y^j} y^j \right) - c_{x^j x^j} \leq 0$$

Using Eq. (9)), we can rewrite the latter expression as follows:

$$2E_{y^j g}^j \tau_{y^j y^j} - E_{y^j y^j} - E_{gg}^j (\tau_{y^j y^j})^2 - (1 - E_g^j) \tau_{y^j y^j} y^j \leq \frac{c_{x^j x^j}}{y_{x^j}^j y_{x_j}^j} \left(1 - \frac{y_{x^j x^j}^j}{y_{x^j}^j} \frac{c_{x^j}}{c_{x^j x^j}} \right)$$

For x^{j0} to be a global maximum, we need the LHS to be smaller than the RHS in the above expression. The RHS of this inequality is unambiguously positive. As for the LHS, the first two terms are negative, the third term is positive, and the sign of the last term depends on the sign of $\tau_{y^j y^j}$. Under the plausible assumption that $\tau_{y^j y^j}$ is close to zero, the SOC will be automatically satisfied if the sum of the first three terms on the LHS is negative. A fortiori, this will be true if the sum of the first and the third terms is negative. Therefore, a sufficient (but not necessary) condition for the SOC to be satisfied is: $(2E_{y^j g}^j - E_{gg}^j \tau_{y^j y^j}) \tau_{y^j y^j} < 0$. Bearing in mind that $\tau_{y^j} = E_{y^j g}^j / (E_{gg}^j y^j)$, the sufficient condition can be re-written thus: $2E_{y^j g}^j / E_{gg}^j > E_{y^j g}^j / E_{gg}^j$.

A.2. Comparative statics results

$$\frac{dg}{de_i} = \frac{\partial g}{\partial \tau} \frac{\partial \tau}{\partial e_i} = -\frac{E_{gg}^i}{E_{gg}^i} > 0$$

$$\frac{dg}{de_j} = \frac{\partial g}{\partial \tau} \frac{\partial \tau}{\partial y^j} \frac{\partial y^j}{\partial \alpha^j} \frac{\partial \alpha^j}{\partial e^j} = \frac{E_{gy^j}^i}{E_{gg}^i} y_{x^j}^j \frac{y_{x^j}^j \left(-E_{y^j e^j}^j + \frac{E_{ge^j}^j E_{gy^j}^j}{E_{gg}^i} \right)}{SOC^j} < 0$$

$$\frac{dg}{d\alpha^i} = \frac{\partial g}{\partial \tau} \frac{\partial \tau}{\partial \alpha^i} + \frac{\partial g}{\partial \alpha^i} = y^i \frac{E_{gg}^i (1 - \tau) y_{x^i}^i}{E_{gg}^i y^i} - (1 - \tau) y_{x^i}^i = (1 - \tau) y_{x^i}^i - (1 - \tau) y_{x^i}^i = 0$$

$$\frac{dg}{d\alpha_j} = \frac{\partial g}{\partial \tau} \frac{\partial \tau}{\partial y^j} \frac{\partial y^j}{\partial \alpha^j} = -\frac{E_{gy^j}^i}{E_{gg}^i} y_{x^j}^j < 0$$

$$\frac{d\alpha^j}{de^i} = -\frac{y_{x^j}^j \tau_{e^i} y^i (E_{y^j g}^j - E_{gg}^j)}{SOC^j} \leq 0$$

$$\frac{d\alpha^j}{d\alpha^i} = \frac{\partial \alpha^j}{\partial g} \underbrace{\frac{dg}{d\alpha^i}}_{=0} = 0$$

$$\frac{d\alpha^j}{d\alpha^j} = -\frac{y_{x^j}^j \left[1 - E_{y^j}^j - (1 - E_g^j) \tau_{y^j} y^i \right]}{SOC^j}$$

$$\frac{y_{x^j}^j y_{x^j}^j \left(2E_{y^j g}^j \tau_{y^j} y^i - E_{y^j y^j}^j - E_{gg}^j (\tau_{y^j} y^i)^2 - (1 - E_g^j) \tau_{y^j} y^i \right)}{SOC^j} \leq 0$$

A.3. Comparative statics on the condition for parasitism

Regarding the first partial derivative, we have $\partial(x_j^o - x_j^a) / \partial e^i = \partial x_j^o / \partial e^i > 0$.

To determine the sign of the second derivative, denote first the squared bracketed term of (10) by C^p . Since $C^p \geq 1 \iff x_j^o \geq x_j^a$, the sign of $\partial(x_j^o - x_j^a) / \partial \alpha^j$ is the same as the sign of $\partial C^p / \partial \alpha^j$. Taking the derivative of C^p w.r.t. α^j yields:

$$C_{\alpha^j}^p = y_{x^j}^j \left[E_{y^j \tau}^j \tau_{y^j} y^i - E_{y^j y^j}^j - \tau_{y^j} y^i \left(1 - E_t^j \right) - \tau_{y^j} \tau_{y^j} y^i y^i E_{tt}^j + \tau_{y^j} y^i E_{\tau y^j}^j \right] = y_{x^j}^j \left[2E_{y^j \tau}^j \tau_{y^j} y^i - \tau_{y^j} \tau_{y^j} y^i y^i E_{tt}^j - E_{y^j y^j}^j - \tau_{y^j} y^i \left(1 - E_t^j \right) \right]$$

This last expression has already been shown to be negative in the proof of the equilibrium unicity (Appendix A.1). We thus conclude that $C_{\alpha^j}^p < 0$, meaning that parasitism is increasing in α^j .

A.4. Evolution of feasibility conditions

The gift-making condition is satisfied if:

$$C^m = E^i(e^i, (1 - \tau)y^i, y^j) - (1 - \tau)y^i > 0$$

While the gift acceptability condition is satisfied if:

$$C^a = U^{j^o} - U^{j^a} > 0$$

Changes in e^i

$$\frac{dC^m}{de^i} = E_{e^i}^i - E_g^i \tau_{e^i} y^i + \tau_{e^i} y^i + E_{y^j}^i y_{x^j}^j g_{\tau} \tau_{e^i} = \underbrace{E_{e^i}^i}_+ + \underbrace{E_{y^j}^i y_{x^j}^j g_{\tau} \tau_{e^i}}_{-+/-} > 0$$

$$\frac{dC^a}{de^i} = y_{x^j}^j \chi_{g e_i}^j - c_{x^j} \chi_{g e_i}^j - E_{y^j}^i y_{x^j}^j \chi_{g e_i}^j - \tau_{e^i} y^i + E_g^i \tau_{e^i} y^i$$

$$= \chi_{g e_i}^j \left(y_{x^j}^j - c_{x^j} - E_{y^j}^i y_{x^j}^j \right) - (1 - E_g^i) \tau_{e^i} y^i$$

Substituting agent j 's F.O.C. (Eq. (9)) in this last expression, we obtain:

$$\frac{dC^a}{de^i} = \underbrace{y^i \tau_{ej}}_{+-} \left(\underbrace{1 - E_g^j}_{+} \right) \left(\underbrace{x_{gj}^j \tau_{yj}^j}_{---++} - 1 \right) \leq 0$$

Changes in e^j

$$\frac{dC^m}{de^j} = -E_g^i \tau_{ej} y^j + E_{yj}^i y_{ej}^j + \tau_{ej} y^i = E_{yj}^i y_{ej}^j + (1 - E_g^i) \tau_{ej} y^i = \underbrace{E_{yj}^i y_{ej}^j}_{-+} < 0$$

$$\frac{dC^a}{de^j} = y_{ej}^j - c_{ej}^j - \tau_{ej} y^i - E_{ej}^j + E_g^j \tau_{ej} y^i - E_{yj}^j$$

$$\left(\underbrace{y_j^j (1 - E_{yj}^j - (1 - E_g^j) \tau_{yj}^j) - c_{yj}^j}_{\text{F.O.C. of } i} \right) x_{ej}^j - E_{ej}^j = - \underbrace{E_{ej}^j}_{+} < 0$$

Changes in α^j

$$\frac{dC^m}{d\alpha^i} = E_g^i (1 - \tau) \frac{\partial y^i}{\partial \alpha^i} - E_g^i \tau_{yi} \frac{\partial y^i}{\partial \alpha^i} y^i + \tau_{yi} \frac{\partial y^i}{\partial \alpha^i} y^i - (1 - \tau) \frac{\partial y^i}{\partial \alpha^i}$$

$$= \left(\underbrace{1 - E_g^i}_{=0} \right) y_{\alpha i}^i (\tau_{yi} y^i - (1 - \tau)) = 0$$

$$\frac{dC^m}{d\alpha^i} = \frac{\partial C^m}{\partial g} \underbrace{\frac{\partial g}{\partial \alpha^i}}_{=0} = 0$$

Changes in α^j

Define \tilde{y}^j as the minimum production level of j such that $\tau(\tilde{y}^j) = 0$. Since $\lim_{y^j \rightarrow 0} E_g^i = E(e^i, g(0), 0)_g = \infty$, it follows that in the neighborhood of $y^j = 0$, $g = y^j$. Hence $\tilde{y}^j > 0$. By implication, the minimum productivity level of j , $\tilde{\alpha}^j$ such that $\tau^o(\tilde{y}^{j0}) = 0$ is strictly larger than 0. As a consequence, $\forall \alpha^j \leq \tilde{\alpha}^j$, $\tau_{yj} = 0$, implying that $dC^a/d\alpha^j = -E_{yj}^j y_{\alpha j}^j > 0$.

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