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PARADOXES OF THE WAR ON POVERTY: WARM-GLOWS AND EFFICIENCY

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Abstract

The universal moral public good of fighting poverty is provided by both public and private transfers. Efficient public transfers do not crowd out giving because of the particular motives for it. Understanding these effects is necessary for both explaining aid and choosing policy. This analysis reveals puzzling paradoxes, contradictions and impossibilities and the few remaining possible explanations are shown. This investigation includes the various possible types of "warm-glows" (sacrifice or responsibility, praise, altruism-based, shallow, external), the reasons for implicit cooperation, putative reciprocity and policy incentives. The large number of people concerned eliminates important possibilities (although it favours others).

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I. Introduction and overview

Explaining the important free contributions to collective action and public goods is a main problem of public economics, of economics and of social science. The standard model finds free riding, especially in large numbers. When fiscal transfers also contribute to financing the good, the standard model can neither explain these transfers nor help choosing them, since it foresees that they are exactly compensated by lower private contributions.[1] According to this model, everybody can be better off if these fiscal transfers crowd out almost all private contributions. Then, however, these contributions cannot be explained. In particular, fighting poverty may be the most important economic objective. Since everybody wants the poor to be less poor (no matter how little they are ready to pay for it – everybody is a large number), this is a universal non-excludable public good.[2] Fighting poverty is made thanks to both fiscal and private transfers. Hence, the logical puzzles just noted are present. In particular, a Pareto-efficient public policy should (almost) fully crowd out private gifts. And political life tends to induce the realization of measures that make everybody better off. Actually, however, private gifts are far from being crowded out. They commonly amount to a few per cent of GNP, up to 5%.[3] 9 Americans in 10 report having given over the past year. Half of them claim deduction for giving in their income tax report.

These facts might a priori be explained by motives for giving that are not simply and directly helping the poor because of altruism (compassion, empathy, pity, sense of injustice). A number of these motives lead to the consideration of rather direct preferences about individuals' gifts or contributions (gifts plus taxes for helping the poor). We denote them as "warm-glows", thus extending, for convenience, focus or illustration, Andreoni's term for a direct preference about one's own gift, although this term describes well a fraction of these motives only. Warm-glows have been the object of many important studies which, however, did not point out a number of basic distinctions, possibilities, properties and paradoxes.[4]

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[1] See Warr (1982), Roberts (1984), Bergstrom, Blume and Varian (1986), and Kolm (1970a, 1970b, 1971). These free and fiscal transfers are non-cooperative (in particular with Cournot-Nash behaviour).

[2] With respect to helping, some people help some poor with the understanding that others help other poor (the French bourgeois ladies used to answer demands of charity with "I have my poor").

[3] In the Netherlands.

[4] In economics, introducing the gift directly in the giver's utility function was suggested by Olson (1965), Arrow (1972), Becker (1974), Sugden (1982) who points out that "social acclaim" of gifts is a priori based on people valuing the benefit, and the consequences were worked out by Cornes and Sandler (1984a, 1984b, 1986, for a contribution to an ordinary public good), Roberts (1984, 1987),

These results will appear here straightforwardly from the simple device of comparing, for each individual, the marginal conditions for a positive gift and for a Pareto-efficient fiscal transfer. In particular, the following results will appear.

The enjoyment of feeling praiseworthy or not guilty, or of being praised or not blamed, because of one's sacrifice that helps the poor, by one's contribution (gift and tax) to their welfare – that is, the *sacrifice warm-glow* – happens to be unable to explain giving in the presence of efficient taxation. Similar sentiments aroused by one's gift alone because one is responsible for it – the *responsibility warm-glow* – could provide the explanation if it did not meet another obstacle due to the large number of people concerned about the poor's welfare. Indeed, explaining any one gift in this way requires that almost every non-poor thinks that the poor have enough. It may be added that one cannot give in order to be praised or praiseworthy as a compassionate altruist since this altruism is not the motive. Moreover, it seems that the reason for warm-glow, apart from the poor's gratitude, is some altruism valuing the poor's welfare (*altruism-based warm-glow*). However, it seems difficult, psychologically, to enjoy one's gift *in itself* (hence apart from its contribution to the poor's welfare) *because* one is altruistic (i.e. because it augments the poor's welfare) (*self altruism-based warm-glow*); at any rate, in large number almost everybody should see no value in the poor's extra welfare if there is one gift. Yet, the giver may enjoy the praise of other altruists whose large number may compensate this vanishing altruism (*praise altruism-based warm-glow*), but this compensation turns out to be very unlikely.

Other warm-glows result from judgments not *directly* motivated by altruism. *Shallow warm-glows* are caused by following given norms, traditions, habits, moral injunctions, or from imitation or comparisons, referring directly to gifts or contributions. "*External glows*" may denote people's preferences about others' gifts or contributions, for reasons of comparisons such as envy, sentiments of inferiority or superiority, lower inequality or conformity: they can explain a person's *gift* by other people wanting her to *contribute* (by gift or tax) *less* – and with a lower but still probably present similar large-number problem. Moreover, a policy discarding the effects of immoral sentiments (vainglory, envy, sense of superiority) from the social objective (from individuals' preferences defining Pareto

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Kolm (1984), extensively Andreoni (1989, 1990) for warm-glow, Harbaugh (1998a, 1998b) for prestige, and an abundant literature exhaustively referred to and discussed in several chapters of the *Handbook of the Economics of Giving, Altruism and Reciprocity* (Kolm and Mercier Ythier, eds., 2006).

efficiency or a social welfare function) leads to another paradox: the effect of vainglory about the sacrifice of the gift is now added to that about the giver's responsibility for helping (by contrast, such laundering of immoral external glows has no effect); but this still leaves the effect of large numbers.

People may also give to the poor for a reason of implicit cooperation of a number of possible types, which may exist for all public goods, but with some particular aspects due to the nature of the good and to the large number. In sequential giving, punishing a free rider by providing less next time punishes the poor and all the other altruists (and the actions of a "small" agent in a large number are not even noticed). Other motives are reasons of the "Kantian" family, either folk-Kantianism ("what if nobody gives?") or more genuine Kantian ethics ("follow a rule that you could want everybody to follow", for instance I want to be helped if I come to need it); however, when applied to specific gifts this leads people to choose assuming that others act otherwise than they do when they follow the same ethics. The lateral reciprocity or moral matching of freely doing one's fair share given that others do theirs requires forcing people so that others are sure that they contribute; then these contributions are no longer free gifts, and yet the payer wants to provide them and the constraint is not binding although it is necessary. There may also be implicit agreements (technically "social contracts"). These problems have solutions. Moreover, with these cooperative ethics and shallow warm-glows the large number is often favourable to giving.

Other warm-glows result from *putative balance reciprocity*: I should help the needy because they would have helped me if our situations were reversed, or others would help me if I needed it, or the poor would help others if they could. Finally, whatever the motive or reason for giving, tax rebates, matching grants and subsidies turn out to have no effect if the givers (and the analysis) take the cost of financing these public expenditures into account.

2. The framework[5]

[5] The very simple and general model used here encompasses many models used in the literature which specify variables or relations, explain or justify them by a theory or by observation, and often apply the model to particular important issues. For example, Brekke, Kverndokk and Nyborg (2003) and Konow (2007) consider norms of giving with an ideal level but a lower provision because of self-interest (the relevant issue here will be the distinction between norms justified by altruism and other norms of giving). Holländer's (1990) model of contributions to any public good motivated by the judgment of the relevant people (also Rege and Telle, 2004) applies particularly for the important, moral and universal public good of the relief of poverty. Harbaugh focuses on prestige and applies this

For fighting poverty, non-poor individual i gives an amount $g_i \geq 0$, pays distributive taxes $t_i \geq 0$ (the part of her taxes that finances public programs against poverty) and hence contributes $c_i = g_i + t_i$. Her initial wealth of X_i becomes $x_i = X_i - c_i$. By nature, $x_i \geq 0$, and in fact $x_i > 0$ since, if $x_i = 0$, individual i would be poor or, rather, would starve. The poor receive Σc_i and hence, with an initial wealth of X, have finally $x = X + \Sigma c_i$. They are sufficiently taken aggregatively and have a utility function $u(x)$ with $u' > 0$ (alternatively, there are N identical poor who receive each x/N and have a utility function $u(x/N)$). Individual i has a utility function u^i. It depends on x_i with $\partial u^i / \partial x_i = u_1^i > 0$. When $x_i \to 0$, $u_1^i \to \infty$, so that any choice of g_i by individual i or of t_i by the fiscal authority guarantees $x_i > 0$. This implies that, for these choices, $g_i \in [0, X_i - t_i[$ and $t_i \in [0, X_i - g_i[$. Function u^i may also depend on x with $\partial u^i / \partial x = u_2^i \geq 0$ (this may result from an implicit dependence on the poor's welfare $u(x)$, or possibly from a dependence on both x and $u(x)$, and then u_2^i stands for $\partial u^i / \partial x + u' \partial u^i / \partial u$). We shall call the case $u_2^i > 0$ altruism, although it might also result from other reasons such as fear of the poor's social unrest, or comparative national pride in having a lower poverty.

The government chooses taxes t_i to achieve Pareto efficiency given the constraints (in particular the type of agents' behaviour such as Cournot-Nash). This may be for a moral reason and/or for a political one since democracy tends to induce Pareto efficiency.[6] This is described by the maximization of a preference-respecting social welfare function

$$U(\{u^i\}, u), \tag{1}$$

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model for specific results. Admiration, gratitude and signal of wealth (Glazer and Konrad, 1996) have been discussed. The properties that turn out to be crucial cut across all the specific manifestations and are general distinctions such as: is the warm-glow for the giver's sacrifice or for her responsibility? Does it require altruism or not? Does the social welfare function include the poor's welfare? Does it respect the givers' immoral sentiments (vanity, vainglory, envy, sentiment of superiority) or not? Do the givers abide by some moral reason or by some norm of cooperation, and which ones?

[6] Democracy tends to prevent society from being in a state such that possible others are preferred by everybody (with possible indifference for some), at least durably and given the constraints of all types. In particular, in an electoral democracy, the existence of such states means that a contending party can propose an alternative program that will carry the unanimity of expressed votes. The following results will derive from the sole Pareto efficiency property of government policy or of optimality. Insofar as government policy is the outcome of political life that produces a Pareto-efficient outcome, the fact that officials do not know the utility functions of the citizens is not relevant. At any rate, Pareto efficiency is defined for constraints including those concerning information. Coase's "theorem" proposing that Pareto efficiency always holds if all costs and constraints of all types are taken into account is also relevant here. If it is right, any model of government policy that induces Pareto inefficiency is mistaken.

With $\partial U/\partial u^i = \lambda_i > 0$ and $\partial U/\partial u = \lambda \geq 0$. The presence of u in this function formally differentiates this problem from the case of other public goods for the contributors i. However, there are two types of "regimes". In the cases of the *basically giving regime*, function U does not depend actually on u and $\lambda=0$. The highest U nevertheless achieves Pareto efficiency for all individuals *including the poor* in this case if *a change in the set of taxes* t_i *affects et least one* u^i.[7] This condition is a priori satisfied except fortuitously, and it is assumed. In the other case, the *redistributive regime*, $\lambda>0$. This may manifest a political or social power of the poor (votes or threat of social unrest); or a desire to redistribute more to the poor than manifested by functions u^i alone, for instance a desire of distributive justice elaborated at the level of society whereas the transfers induced by functions u^i alone would more be induced by compassion.[8] Finally, we assume $\lambda_i>0$ for all i although $\lambda_i=0$ is consistent with a Pareto efficient outcome, since this outcome would generally imply $x_i=0$ which is excluded.

3. The sacrifice and responsibility warm-glows

3.1 The contribution or sacrifice warm-glow

Individual i's contribution c_i is the cost for her, her sacrifice, that benefits the poor. If this may arouse a warm-glow for individual i,

$$u^i = u^i(x_i, x, c_i) \qquad (2)$$

with $\partial u^i/\partial c_i = u^i_c \geq 0$ if individual i chooses a gift $g_i>0$,

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[7] For a Cournot-Nash relation between the government policy and the givers, this is for given gifts $\{g_j\}$. The noted condition even needs to hold only at states that are Pareto efficient for the non-poor. From such a state, indeed, change the set of taxes $\{t_j\}$. Then a number of levels u^i change (at least one). All these changing u^i cannot all increase, from the definition of Pareto efficiency (for the non-poor). Hence, at least one decreases. But this decreasing u^i is also a decreasing member of the larger set encompassing all u^i and u. Hence, any possible change in the set of taxes t_i from the state in question makes one member of this larger set of the u^i and u decrease. Therefore, no possible change in the set of taxes t_i from this state makes all the u^i and u increase or not change with at least one increasing. Hence, by definition, the state in question is Pareto efficient for the whole population of the non-poor and of the poor. These properties are applications of general theorems (see appendix A).

[8] Almost all the literature on altruism and giving omits the case of the redistributive regime. Hence it bans the poor from the social welfare function and from the definition of Pareto efficiency, and considers them as altruists' "consumption" only. Exceptions in which the poor's welfare is an argument of the government's maximand because of the receivers' political power are found in Roberts (1984), Becker (1978) and, somehow, Peltzman (1976).

$$du^i/dg_i = -u_1^i + u_2^i + u_c^i = 0. \quad (3)$$

If all individuals j have similar concerns and utility functions of form (2), the government's choice of tax t_i satisfies

$$dU/dt_i = \lambda_i \cdot (-u_1^i + u_2^i + u_c^i) + \Sigma_{j \neq i} \lambda_j u_2^j + \lambda u' \leq 0 \quad (4)$$

with sign = if $t_i > 0$. Conditions (3) and (4) together imply

$$\Sigma_{j \neq i} \lambda_j u_2^j + \lambda u' \leq 0 \quad (5)$$

This condition does not contain u_c^i. The result is the same as if function u^i of form (2) did not contain c_i and were simply $u^i = u^i(x_i, x)$ (i.e. pure altruism only is possible for individual i). *The warm-glow has no effect on crowding out*. However, *the result depends on the regime*. In the *redistributive regime* ($\lambda > 0$), $g_i = 0$ for all i, *crowding out is complete*. In the *basically giving regime* ($\lambda = 0$), $g_i > 0$ implies $u_2^j = 0$ for all $j \neq i$; hence, there is *at most one giver*; at the margin, there is also at most one altruist (the same person) and hence x is no longer an actual public good for the givers.

3.2 The responsibility warm-glow

However, individual i may experience a warm-glow not because of the cost for her that benefits the needy, but because of this cost and benefit she is responsible for. A priori, she does not choose the tax t_i she pays and hence she is not responsible for it. On the opposite, a priori she chooses her gift g_i and is responsible for it. One should thus distinguish the *sacrifice warm-glow* concerned with the cost to the person that benefits the needy (irrespective of who decides), and the *responsibility warm-glow* concerned with the part of this cost and benefit the person chooses and is responsible for. Note that responsibility requires a sacrifice-benefit on which it is applied. This is the gift g_i.[9]

Then, with a responsibility warm-glow only,

$$u^i = u^i(x_i, x, g_i). \quad (6)$$

with $\partial u^i/\partial g_i = u_g^i \geq 0$. If individual i chooses to give $g_i > 0$,

$$du^i/dg_i = -u_1^i + u_2^i + u_g^i = 0. \quad (7)$$

[9] The question of information and qualifications about responsibility may be relevant. See appendix B.

If all individuals *j* have similar concerns and utility functions of form (6), the government's choice of tax t_i satisfies

$$dU/dt_i=\lambda_i\cdot(-u_1^i+u_2^i)+\Sigma_{j\neq i}\lambda_j u_2^j+\lambda u'\leq 0 \quad (8)$$

with sign = if $t_i>0$. Conditions (7) and (8) together imply

$$\lambda_i u_g^i\geq\Sigma_{j\neq i}\lambda_j u_2^j+\lambda u' \quad (9)$$

or, denoting

$$v=\Sigma_j\lambda_j u_2^j+\lambda u' \quad (10)$$

the marginal social value of the poor's income *x*,

$$\lambda_i\cdot(u_2^i+u_g^i)\geq v, \quad (11)$$

with sign = if $t_i>0$.

3.3 Both warm-glows, the two formulations

However, one may have jointly and distinctly a warm-glow for sacrifice and one for responsibility. The effect of gift g_i cumulates both, but an effect of the distributive tax t_i is a pure sacrifice warm-glow. These effects can be represented in two ways in the utility functions. One can write

$$u^i=u^i(x_i, x, c_i, g_i) \quad (12)$$

where c_i induces the sacrifice warm-glow and the argument g_i represents the effect of the responsibility warm-glow only (the sacrifice effect of g_i is taken into account by its presence in $c_i=g_i+t_i$). At the margin, the sacrifice warm-glow induces u_c^i, the responsibility warm-glow induces u_g^i, the total warm-glow effect of gift g_i is $u_c^i+u_g^i$, and the warm-glow effect of the tax t_i distributed to the poor is only the sacrifice effect inducing u_c^i.

In an alternative formulation,

$$u^i=u^i(x_i, x, t_i, g_i) \quad (13)$$

where t_i creates a pure sacrifice warm-glow (t_i is the tax, or the part of taxes, that is known to be used to help the poor), and g_i creates both a responsibility and a sacrifice warm-glow. Denote $u_t^i=\partial u^i/\partial t_i\geq 0$. At the margin, the pure sacrifice warm-glow induces u_t^i, hence the

pure responsibility warm-glow effect induces $u_g^i - u_t^i = u_r^i$ by definition of this symbol. With formulation (12), $u_r^i = u_g^i$.

With formulation (12), if individual *i* chooses a gift $g_i>0$,

$$du^i/dg_i = -u_1^i + u_2^i + u_c^i + u_g^i = 0. \tag{14}$$

With similar utilities for all *j*, the government chooses tax t_i that satisfies

$$dU/dt_i = \lambda_i \cdot (-u_1^i + u_2^i + u_c^i) + \Sigma_{j\neq i}\lambda_j u_2^j + \lambda u' \leq 0 \tag{15}$$

with sign = if $t_i>0$. Then, conditions (14) and (15) imply

$$\lambda_i u_g^i \geq \Sigma_{j\neq i}\lambda_j u_2^j + \lambda u' \tag{16}$$

or

$$\lambda_i \cdot (u_2^i + u_g^i) \geq v \tag{17}$$

which are relations (9) and (11) with different functions.

With formulation (13), if individual *i* chooses a gift $g_i>0$,

$$du^i/dg_i = -u_1^i + u_2^i + u_g^i = 0. \tag{18}$$

With similar utility functions for all *j*, the government chooses tax t_i that satisfies

$$dU/dt_i = \lambda_i \cdot (-u_1^i + u_2^i + u_t^i) + \Sigma_{j\neq i}\lambda_j u_2^j + \lambda u' \leq 0 \tag{19}$$

with sign = if $t_i>0$. Then, conditions (18) and (19) imply

$$\lambda_i \cdot (u_g^i - u_t^i) \geq \Sigma_{j\neq i}\lambda_j u_2^j + \lambda u' \tag{20}$$

or

$$\lambda_i u_r^i \geq \Sigma_{j\neq i}\lambda_j u_2^j + \lambda u', \tag{21}$$

that is

$$\lambda_i \cdot (u_2^i + u_r^i) \geq v. \tag{22}$$

This confirms that, in relations (16) and (17), u_g^i represents the responsibility warm-glow only and in nothing the sacrifice warm-glow.

Hence, the responsibility warm-glow offers the obtained possibility for $g_i>0$ (non-crowding out), and the sacrifice warm-glow has no effect.

These different warm-glows and their relations are neatly shown by the neuroeconomic experiments performed by Harbaugh, Mayr and Burghart (2007). The subjects respond to the transfer of some amount of money attributed to them to a food bank by neural excitements of the reward system, and more when it is a voluntary gift from them than when it is a forced transfer. All subjects manifest these effects.

4. Irrationality, immorality, and the moral and rational social efficiency

4.1 Irrationality of the responsibility warm-glow

The fact that the responsibility warm-glow alone is accountable for non-crowding out in conditions (16) or (21) is puzzling since this assumed sentiment is irrational.

Indeed, responsibility warm-glow is self-contradictory: one cannot give in order to be praiseworthy or praised as a compassionate altruist since this motive is not altruistic compassion. Sacrifice warm-glow, of a different (and – it seems – milder) type, avoids this inconsistency since it is not the result of a choice, but it cannot explain giving, as we have seen. The warm-glow objective of giving may then be to deceive other people by making them believe that one is a compassionate altruist. This fraud is immoral, nothing to be proud of. The effect may also be self-deception, leading one to have some impression of being the moral compassionate altruist that one is not, as psychoanalysis may be able to explain. This is an irrationality, however.[10]

4.2 Laundering preferences

Another important aspect is that warm-glow is often, in fact, vanity and vainglory, sometimes accompanied by a sentiment of superiority.

Warm-glow thus tends to be immoral and irrational, with important consequences.

[10] The non-altruistic giver may also give because she wants to be a (compassionate) altruist and knows that a classical way to try to have a sentiment is to act as if one had it (with the help of dissonance reduction). This is probably still more praiseworthy than being altruistic.

The social criterion may have not to respect individuals' immoral social sentiments (should someone be deprived of something because some other people envy her?).[11] It may also have to discard contradictory aspects of individual preferences, but we will shortly see that this has no consequence on the non-crowding out condition.

The method for laundering preferences for the effects of some variables, with preferences of general form, consists of assuming that these variables have some fixed level. In general, this level matters for the result. If there is no a priori given natural level for this purpose, the consistent and rational solution consists of choosing the level that would result from choices in which its variability has no effect. In the present problem, this means deleting the effects of the corresponding variables (g_i, c_i or t_i) in the conditions of the government's choice of t_i (conditions (15) or (19)). New conditions replacing conditions (16) or (20) are then obtained, and the t_i and g_i result from the solution of the 2 n conditions of their choice (where n is the number of non-poor i). The effect of the variable in question is erased, and the choosen level of the variable is that consistent with the whole situation. The conditions of the individual choice of the free gifts g_i do not see their form affected since the individuals are free and the present issue is not moral education.

Conditions (15) and (19) do not contain u_g^i. Therefore, laundering preferences for effects due to the responsibility warm-glow has no consequence. This is remarkable since it is precisely the responsibility warm-glow that, in the end, provide the non-crowding out conditions (16) and (21). Moreover, the noted irrationality (contradiction) concerns the responsibility warm-glow. Laundering the effects of the sacrifice warm-glow (for instance because it would be vanity and vainglory) consists of deleting terms u_c^i and u_t^i in relations (15) and (19) respectively. In both cases, the result is

$$dU/dt_i=\lambda_i\cdot(-u_1^i+u_2^i)+\Sigma_{j\neq i}\lambda_j u_2^j+\lambda u'\leq 0 \qquad (23)$$

with sign = if $t_i>0$.

In the first formulation (utility of form (12)), condition (23) with condition (14) give

[11] If Pareto efficiency results from political life, people may impose the government to respect their full preferences, including their vices. However, they may also agree, in the public discussion or in a collective agreement, to discard these immoral aspects for the social moral choice. They may even enjoy that the government discards these regrettable aspects of their preferences that they do not have the willpower to abandon by themselves.

$$\lambda_i \cdot (u_c^i + u_g^i) \geq \Sigma_{j \neq i} \lambda_j u_2^j + \lambda u' \quad (24)$$

or

$$\lambda_i \cdot (u_2^i + u_c^i + u_g^i) \geq v. \quad (25)$$

In the second formulation (utility of form (13)), condition (23) with condition (18) give

$$\lambda_i u_g^i = \lambda_i \cdot (u_t^i + u_r^i) \geq \Sigma_{j \neq i} \lambda_j u_2^j + \lambda u' \quad (26)$$

or

$$\lambda_i \cdot (u_2^i + u_g^i) = \lambda_i \cdot (u_2^i + u_t^i + u_r^i) \geq v. \quad (27)$$

This motivation that produces this condition, creating $u_c^i + u_g^i$ in the first formulation and $u_r^i + u_t^i$ or u_g^i in the second, is a *responsible sacrifice warm-glow*, corresponding to both effects of the gift g_i.

This result is important and paradoxical. Conditions (24) and (26) tend a priori to be more easily satisfied than conditions (16) and (21) since a term which can be positive (and is non-negative), u_c^i and u_t^i respectively, is added in the left-hand side.[12] Psychologically, this means that the sacrifice warm-glow is added to the responsibility warm-glow. The paradox is that by erasing the effect of warm-glow in the objective function, this effect is reinforced as a result, since the sacrifice warm-glow is now added to the responsibility warm-glow in the final conditions for non-crowding out. More precisely, the laundering happens to bear on the sacrifice warm-glow only, and it is the effect of this sentiment that is now added to the non-crowding out conditions.

5. The basic efficiency condition

The basic efficiency condition for public goods with warm-glows permits one to see simply some important properties. With the first formulation for instance (function (12)), condition (17) for $g_i > 0$ implies

[12] However, the variables in all the terms of the conditions no longer have the same value, and hence an opposite conclusion is a priori possible with some form of the utility functions.

$$\lambda_i \cdot (u_2^i + u_g^i) \geq v \geq \Sigma_{j \in G} \lambda_j u_2^j + \lambda u' \qquad (28)$$

where $G=\{i: g_i>0\}$ is the set of actual givers. Assume that the poor's income is socially valuable, $v>0$, which implies $\lambda>0$ or $u_2^j>0$ for at least one j. Condition (28) then implies, for $i \in G$, $u_2^i + u_g^i > 0$, and $\lambda_i \geq v/(u_2^i + u_g^i)$. Then (28) for all $i \in G$ implies

$$\Sigma_{i \in G}[u_2^i/(u_2^i + u_g^i)] + \lambda u'/v \leq 1.^{13} \qquad (29)$$

This confirms that with $u_g^i=0$ for all i, there can be no giver in the redistributive regime ($\lambda>0$) and at most one in the basically giving regime ($\lambda=0$). Another crucial consequence is noted shortly.

For the morally laundered Pareto-efficient fiscal policy, with the first formulation, a similar derivation from condition (25) gives the condition

$$\Sigma_{i \in G}[u_2^i/(u_2^i + u_g^i + u_c^i)] + \lambda u'/v \leq 1, \qquad (30)$$

with similar conclusions with reference to both sacrifice and responsibility warm-glows (produced by gifts g_i).

6. Consequences of the large number

6.1 Vanishing individual altruism[14]

When n becomes large, the non-crowding out conditions (9), (16), (20), (24) and (26), with limited u_g^i, u_c^i and u_2^i, imply that $\Sigma \lambda_j u_2^j$ remains finite, and hence that average u_2^j vanishes: $\bar{u}_2 = (1/n)\Sigma u_2^j \to 0$. This implies $u_2^j \to 0$ for all j except possibly for a vanishing fraction of them (i.e. for "almost all" j). That is, in the limit, if any one gift is not crowded out, almost all non-poor individuals think that the poor have enough. This does not seem to be the case. This seems to be, a priori, the basic obstacle to the explanation of non-crowding out of gifts to fight poverty by the consideration of warm-glows in the strict sense described as a preference for one's gift in itself.

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[13] With sign = if $t_i g_i>0$ for all i (everybody pays the tax and gives).

[14] The number of people who favour the poor to be less poor is large, practically everybody (even though nations or other communities largely specialize in actually helping their own poor, given that other groups do the same). The issue is this large number; it is not a duplication of societies with an increase of both the non-poor and the poor.

6.2 Relative motives

More precisely, the non-crowding out conditions demand that $\bar{u}_2$ for large *n* has an order of magnitude at most 1/*n* times that of u_g^i (or $u_g^i + u_c^i$). Condition (29) implies a related result. If $\Gamma=|G|$ denotes the number of givers, it implies that, on average, u_g^i / u_2^i for $i \in G$ has at least the order of magnitude of Γ. That is: on average, *the last gifts are given at least* Γ *times more for the glory of the giver than for the relief of poverty, where* Γ *is several or many millions*. Condition (30) implies a similar result for morally laundered fiscal policy.

6.3 The possible effects of the large number

When $n \to \infty$, $\Sigma_{j \neq i} u_2^j$, Σu_2^j and $\bar{u}_2$ become, for well-behaved functions, infinite, finite or zero according as $\bar{u}_2$ decreases more slowly than, as fast as, or faster than 1/*n*, that is, as average u^i increases faster than, as, or more slowly than Log *x* (i.e. average compassion diminishes faster than, as fast as, or more slowly than the increase in the logarithm of the relief of poverty). The first case implies crowding-out of gifts. The two others may prevent it. However, the logarithmic structure is a particular one. If there is no particular reason for it, almost all cases in which one gift is not crowded out are with the third case. Then, $\Sigma_{j \neq i} u_2^j \to 0$ by positive values, hence decreasing. Therefore, if u_g^i is bounded from below by a positive value, a sufficiently large *n* entails that the non-crowding out conditions are satisfied for $\lambda=0$ (the "practically giving" regime): the large number is favourable to non-crowding out, contrary to a common view. This happens with both an average compassion decreasing more slowly than the increase in the logarithm of the relief of poverty and a non-vanishing warm-glow.[15] However, u_g^i may also depend on the number, for instance because it may depend on altruism which vanishes. Hence, the causes of or reasons for warm-glow and the structure of their effects must now be considered.

6.4 Altruism-based warm-glows

[15] Ribar and Wilhelm (2002) point out the possibility of complete non-crowding out with an exogenous positive lower bound on u_g^i.

The main reason for praising a gift or a contribution that helps the poor is its contribution to the poor's welfare valued by the poor (who may also be grateful) or by anyone from a sentiment of altruism (due to compassion, pity, sense of justice, and this judgment may be an absence of blame, reproach or scorn for not giving or contributing). The giver or contributor may appreciate this praise (or this absence of blame). Warm-glow due to praise or non-blame, whatever their reason or motive, is *praise warm-glow*. Warm-glow due to altruism is *altruism-based warm-glow*. It does not seem that an altruistic giver/contributor can, because she is altruistic, value her gift or contribution by itself, in addition to its contribution to the poor's welfare (this would be self altruism-based warm-glow). At any rate, when $n\to\infty$, $\bar{u}_2 \to 0$ required by the non-crowding out of any gift implies that u_2^i vanishes for almost all individuals *i*. However, for a warm-glow due to other people's praise, the vanishing of their average u_2^j might a priori be compensated by their large number.

The result depends on how individual *i* evaluates others' opinions. If this individual focuses on the average of their view, perhaps if she considers G.E. Mead's "generalized other", then only the average of these u_2^j, practically $\bar{u}_2$, matters for her. And since it vanishes, so does the u_g^i they induce. This jeopardizes the non-crowding out conditions if $\lambda>0$, or, if $\lambda=0$, in the particular cases in which $n\bar{u}_2$ does not vanish. When $\lambda=0$ and $n\bar{u}_2$ vanishes, a priori it decreases more slowly than u_g^i induced by $\bar{u}_2$, and the effect of the large number favourable to non-crowding out does not hold. However, individual *i*'s sensitivity to the altruistic praises may depend not only on $\bar{u}_2$ but also on the number of praisers which a priori increases with *n*.

One may, then, explicitly write, for these marginal values,

$$u_g^i = \Sigma_{j\neq i}\ \pi_j^i\ u_2^j \qquad (31)$$

where π_j^i is individual *i*'s satisfaction due to individual *j*'s praise motivated by a unit of her satisfaction due to the marginal increase in *x* caused by individual *i*'s gift. Then, condition (16) writes

$$\Sigma_{j\neq i}(\lambda_i \pi_j^i - \lambda_j)\ u_2^j \geq \lambda u'. \qquad (32)$$

This implies $\lambda_i \pi^i_j - \lambda_j > 0$ and sufficiently large for a sufficient number of *j*. For seeing the meaning of this condition, assume that all individuals *i* are identical, hence $\lambda_i = \tilde{\lambda}$ and $u^i_2 = \bar{u}_2$ are the same for all *i*, and denote $\pi^i_j = \pi$. Condition (32) becomes

$$(n-1)\tilde{\lambda}\bar{u}_2(\pi - 1) \geq \lambda u' \qquad (33)$$

which implies, for $\bar{u}_2 > 0$, $\pi \geq 1$ (and $\pi > 1$ if $\lambda > 0$). Hence, one also has $\pi u^j_2 \geq u^i_2$ for all *i* and *j* ($u^j_2 = u^i_2$). This means that when any individual gives an extra dollar, she derives more (at least as much) satisfaction from the praise of *each* of the very numerous others than from her own altruism. This seems unlikely.

These two hypotheses about altruism-based warm-glow are limiting cases. Hence it seems that altruism-based warm-glows lead to large-number crowding-out of almost all gifts.

7. Shallow warm-glows

These difficulties in explaining large-number giving with altruism-based warm-glow leads one to consider the other types of warm-glow. In particular, "shallow warm-glows" have no intrinsic reasoned justification. Notably, they are not motivated by the needy's benefits. They constitute a heterogeneous set including norms of giving per se, tradition, custom, habit and simple imitation. Such norms can be motivated by other people's praise for following them or blame for failing to – not motivated by altruism here – and they may be internalized. Demands, injunctions or praise of moral or social institutions have a role here.[16] These norms are for a "moral behaviour" but they are not intrinsically moral, although people may feel them as purely social or as moral (hence as possibly inducing shame or guilt, respectively, when they are not followed). The amounts of the gifts are sometimes determined by the norm or the custom, rather than by marginal conditions. Such views bear on gifts g_i but they may also bear on contributions c_i and, then, individual *i* adjusts her gift to the distributive tax t_i she pays. If such actions are praised by other people, u^i_g (or u^i_c) may depend on the praises.

8 "External glows": paradoxes and possible effect

[16] However if, or insofar as, these institutions encourage giving in order to keep or obtain the support of altruists, they are just intermediaries in praise altruism-based warm-glow. Moral demands also aim at sentiments by demanding people to be altruists and not only to give.

8.1 External preferences

If an individual *i* values g_j or c_j for some $j \neq i$, and hence praises individual *j* for this gift or values her sacrifice, because she (individual *i*) is altruistic as she values *x*, this cause is manifested by $u_2^i > 0$ (at the margin) and not by a direct preference about g_j or c_j. However, there are a number of possible reasons, shortly noted, for *i* to value directly g_j or c_j (although these reasons ultimately rest on some altruism except in cases of shallow warm-glows). This has two possible types of effects. First, it may influence directly the conditions for non-crowding out. Second, these preferences of individual *i* may lead her to praise higher or lower g_j or c_j and this may influence u_g^j or u_c^j.

Individuals may have preferences about others' contributions or gifts for various reasons other than directly and solely their contribution to the poor's welfare. Praises inducing shallow warm-glows manifest such preferences. An individual may also feel a warm-glow because some member of a community she belongs to gives or contributes for whatever motive ("justified" or not) – she may feel proud of it, or ashamed if the other fails in this respect. A number of such preferences may derive from comparisons between gifts or contributions. This may result, for instance, from inequality-aversion or other sentiment of comparative fairness in giving, contributing or sharing the burden of aid. The comparison may be particularly influential when it involves the evaluator's own contribution or gift. She may feel proud or superior when she provides more, or ashamed, inferior, envious or jealous when she provides less, and different in both cases (which may be regretted or favoured by desires for conforming or for distinction). These comparisons may be qualified for characteristics of the individuals (wealth, social proximity or status, etc.). The sentiments induced tend to increase with the extent of the differences in gifts or contributions. They may influence the person's gifts when either gifts or contributions (given taxes) are compared. This includes, for instance, "keeping up" with others, competitive giving or contributing, avoiding shame or seeking pride, and shunning or seeking conformity or originality.[17]

[17] The moral conduct of "lateral reciprocity" or "moral matching" is considered shortly with other social-moral rational conduct.

These preferences lead to introducing other people's gifts or contributions in utility functions. If $c_{-i} = \{c_j\}_{j \neq i}$ and $g_{-i} = \{g_j\}_{j \neq i}$ denote the set of contributions and gifts of individuals $j \neq i$, individual i's utility function writes, with the formulation corresponding to form (12),

$$u^i = u^i(x_i, x, c_i, g_i, c_{-i}, g_{-i}). \tag{34}$$

8.2 The non-crowding out condition

These influences can lead to dynamics, equilibria, and possibly cooperation, in giving (more directly than through effects on x). Given g_{-i} and the set of taxes $t = \{t_j\}$, each individual i has a preferred gift $g_i = g_i(g_{-i}, t)$. If she takes g_{-i} and t as given, her choice of $g_i > 0$ implies

$$du^i / dg_i = -u_1^i + u_2^i + u_c^i + u_g^i = 0. \tag{35}$$

If the government chooses t_i given the g_j, then, denoting $u_{c_j}^i = \partial u^i / \partial c_j$ and $u_{g_j}^i = \partial u^i / \partial g_j$, this implies

$$dU / dt_i = \lambda_i \cdot (-u_1^i + u_2^i + u_c^i) + \Sigma_{j \neq i} \lambda_j \cdot (u_2^j + u_{c_i}^j) + \lambda u' \leq 0 \tag{36}$$

with sign= if $t_i > 0$. Then, conditions (35) and (36) imply

$$\lambda_i u_g^i \geq \Sigma_{j \neq i} \lambda_j \cdot (u_2^j + u_{c_i}^j) + \lambda u' \tag{37}$$

or

$$\lambda_i u_g^i \geq v + \Sigma_{j \neq i} \lambda_j u_{c_i}^j . \tag{38}$$

This non-crowding out condition for g_i includes two surprises: the $u_{g_i}^j$ are *not* in it and $u_{c_i}^j > 0$ *worsens* the chances for the condition to be satisfied (for given values of the other variables in the condition). *The chances for an individual's gift to be crowded out are not changed by others' appreciation of her decision, and are worsened by their appreciation of her contribution* (sacrifice that helps the poor).

Conditions (37) and (38) for the non-crowding out of g_i are indeed *improved* by $u_{c_i}^j < 0$ for $j \neq i$ (for given other marginal values). This may result from the noted comparative

sentiments applied to contributions. Individual *j* may prefer a lower c_i because this reduces her envy, jealousy, resentment or sense of inferiority if $c_i > c_j$, because it augments her pride or sense of superiority if $c_i < c_j$, or for the other noted comparisons. These comparisons may be qualified for characteristics of the individuals. The overall effect of all these comparisons is likely to induce $u^j_{c_i} < 0$ more (a larger $-u^j_{c_i}$) when c_i is higher.

Therefore, the effects of preferences about an individual's gift or contribution – that is, her responsibility or sacrifice for helping the poor –, for reasons that are not directly altruistic, are strikingly opposed when these preferences are those of this individual or of other people. For own judgements, the contribution has no effect and the gift has one, whereas for judgements of other people the gift has no effect and the contribution has one. Moreover, the chances of non-crowding out are augmented by a preference of the giver for a higher gift and of others for a lower contribution.

8.3 The large number

Since the large number essentially destroys the possibility of non-crowding out due to altruism-based warm-glows, the "external glow" effects of $u^j_{c_i} < 0$ arouses hope because they intervene in condition (37) by their sum $\Sigma_{j \neq i} \lambda_j u^j_{c_i}$ as the u^j_2 do. A priori, $\Sigma_{j \neq i} \lambda_j \cdot (u^j_2 + u^j_{c_i})$ may remain limited even if $\bar{u}_2$ does not vanish. However, this implies that, on average, people dislike an extra contribution by others about as much as they altruistically approve its contribution to the poor's relief. Although the importance of sentiments of envy, inferiority or superiority in society should not be underestimated, it seems rather unlikely that they could have this effect. One reason is that, for each person, such comparisons are often limited to persons of some group for both reasons of estimated relevance and of information, and this group tends to be small compared to the large number of people. However, from a moral point of view for the choice of optimum taxes t_i, the information issue may be irrelevant, and this may also be the case of the sentiment of relevance of comparisons insofar as it also depends on information about other people. Yet moral may rather demand erasing the effects of most of these sentiments rather than extending them.

8.4 Moral efficiency

Sentiments of envy or superiority may have to be laundered from individual preferences defining the policy's objectives. The method is the one discussed above about warm-glows. It leads to deleting $u^j_{c_i}$ for all *j* in condition (36) ($u^j_{g_i}$ is not in it). Then, however, this condition takes form (15) and condition (37) takes form (16). If the warm-glow effects are also laundered out, then condition (36) takes form (23) and condition (37) takes form (24). That is, this laundering of sentiments about other people's contributions (or gifts) gives to the condition for g_i>0 the form it has when these effects do not exist (with different functions, however). This also contrasts with the case of warm-glows (section 4.2).

8.5 Praise (or blame) glows

Moreover, individuals' preferences about others' contributions or gifts by themselves accompany judgments about them which may influence the giver/contributor and modify her u^i_c or u^i_g. This may be reproaches, accusations of conspicuous giving, or praises. They constitute non-altruistic influences on own warm-glows. A positive or negative $u^j_{g_i}$ or $u^j_{c_i}$ for $j \neq i$ may thus induce a higher u^i_g or u^i_c, respectively (although there may be reverse effects; for instance some people may enjoy being envied). The consequences on crowding out are in general the reverse of the noted direct effects. These effects of $u^j_{c_i}$ on u^i_c have no effect, except with a morally laundered social objective. Higher or lower u^i_g due to effects of $u^j_{g_i}$ are favourable or unfavourable to non-crowding out, respectively.[18]

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[18] All these differences in effects are confirmed by considering the formulation corresponding to form (13) for utilities, that is, with these external effects,

$$u^i = u^i(x_i, x, g_i, t_i, g_{-i}, t_{-i}) \tag{39}$$

where $t_{-i} = \{t_j\}_{j\neq i}$ is the set of distributive taxes t_j for all $j \neq i$. Then, if individual *i* chooses g_i>0 for given g_{-i} and *t*,

$$du^i/dg_i = -u^i_1 + u^i_2 + u^i_g = 0. \tag{40}$$

The government's choice of tax t_i for given g_j for all *j* implies, denoting $\partial u^j/\partial t_i = u^j_{t_i}$,

$$dU/dt_i = \lambda_i \cdot (-u^i_1 + u^i_2 + u^i_t) + \Sigma_{j\neq i}\lambda_j \cdot (u^j_2 + u^j_{t_i}) + \lambda u' \leq 0 \tag{41}$$

with sign = if t_i>0. Conditions (40) and (41) imply

8.6 The general form

Condition (37), corresponding to the most general form considered here expressed by the form (34) of utility functions, contains all the previous ones as particular cases. In addition, it includes the cases in which the previously discussed situations concern only some of the individuals, with important consequences.

In particular, if $u^j_{c_i}=0$ for all *j* for some individual *i*, condition (37) takes form (21). This form implies notably that if $g_i>0$ (not crowded out) for large *n*, $\bar{u}_2$ vanishes, that is, in the limit, almost all individuals *i* think that the poor have enough. A single such individual *i* suffices for this drastic conclusion. The sensitivity of all individuals to all the variables except the noted ones can be anything.

If, for some individual *i*, $u^i_g=0$ and $u^j_{c_i}=0$ for all *j*, then condition (37) takes form (5). Gift $g_i=0$ (crowded out) if $\lambda>0$. If $\lambda=0$, $g_i>0$ implies $u^j_2=0$ for all $j\neq i$ (individual *i* is the only possible altruist). This individual *i* may be motivated to give by possible $u^i_2>0$ or $u^i_c>0$ (yet without altruism-based praise warm-glow), but the effect of u^i_c is cancelled out by the policy (except in case of moral laundering). All the other sensitivities of all individuals to all variables may be present. Any other individual $j\neq i$ may give because $u^j_g>0$ (and $u^j_c>0$ with moral laundering).

9. Rational moral-social warm-glows

$$\lambda_i u^i_r = \lambda_i \cdot (u^i_g - u^i_t) \geq \Sigma_{j\neq i}\lambda_j \cdot (u^j_2 + u^j_{t_i}) + \lambda u' \qquad (42)$$

where $u^i_r = u^i_g - u^i_t$ is individual *i*'s (marginal) warm-glow for her responsibility in helping the poor (value of extra gift minus value of the contribution in itself it includes, i.e. marginal value of tax t_i). Condition (42) also writes

$$\lambda_i \cdot (u^i_2 + u^i_r) \geq v + \Sigma_{j\neq i} u^j_{t_i} . \qquad (43)$$

Then, the remarks of the text about laundering immoral sentiments and induced warm-glows can be carried on by replacing u^i_g by u^i_r and u^i_c by u^i_t.

Motives for giving to fight poverty refer sometimes to some moral reasoning or theory more or less elaborate. Three types of them apply to all public goods: implicit agreement, lateral reciprocity or fair matching, and reasonings of the "Kantian" family. On the contrary, the motive of putative reciprocity is specific to giving (irrespective of the public good issue). These reasonings lead to a desire to give or to contribute, and to other people's praise for such behaviour. Both effects can a priori be described by the structure of preferences or utility functions, hence as "warm-glows", although only after the modelling of the corresponding theory. Then, these desires can be mitigated by the effects of g_i or c_i on x_i (self-interest). However, the theories indicate which level of g_i or c_i they require, and this is sometimes followed irrespective of the effects on x_i (see Kant's term "categorical imperative", his insistence that moral does not derive from tastes – "inclinations" – but should rather oppose them, and his counting direct altruism or compassion as a taste).

An implicit agreement between the non-poor for giving or contributing belongs to the theoretical family of social contracts (Rousseau and Hume are clear about the public good nature of social contracts), and there may be some psychic moral cost of shirking (total or partial free riding). Lateral reciprocity or matching is reciprocity with co-givers or contributors (not the usual meaning of the term reciprocity as providing a standard return-gift), that is: given that they give or contribute, then so do I; given that they provide their fair share, I provide mine.[19] The coordination between the participants is solved either by a public enforcement of these gifts (they are no longer free in a strict sense but everybody freely abides by this constraint which guarantees others' contributions), or by a sequential dynamics.[20] Reasons of the Kantian family include folk-Kantianism ("I give because what if nobody gives" – the most common "reason" given for voting in large elections), or ideas' closer to Kant's ("follow the rule that you could want to be followed by everybody"). Kantian conducts raise a problem of consistency: each individual may assume that the others act or follow rules different from those they actually choose, notably if they also have the same Kantian reasoning and conduct. Moreover, the ideals of both fair moral matching and Kantian

[19] For application to public goods see Sugden (1984) and Kolm (1984).
[20] Sequential contributions with or without reciprocitarian motives are analyzed in Kolm (1987), Admati and Perry (1991), Fershtan and Nitzan (1991), Varian (1994), Marx and Matthews (2000) and Masclet, Willinger and Figuières (2007).

conducts may a priori not be Pareto efficient; the conditions under which they are Pareto efficient are presented in Bilodeau and Gravel (2004) and Kolm (2008c).[21]

The large number of givers has the following effects with these three types of reasons for giving or contributing. First, a small psychic moral cost of not abiding by the reason often suffices to give for this reason. This happens when the material advantage of not abiding by the reason vanishes whereas the moral cost does not or does more slowly. The vanishing of the material advantage results notably from the vanishing of the individual contribution applying the reason (even taking account of the possible effect of the choice of a "small" individual on the overall provision of the good with possible normal reactions of the other contributors). This occurs for almost all contributors when the total amount of aid increases more slowly than the number of contributors for large n. For Pareto-efficient levels, this happens when, on average, compassion decreases more slowly than the increase in the logarithm of the relief of poverty. Since individual contributions cannot become infinite, the alternative is that they tend to non-zero levels. This occurs when, on average, a variation of income is compensated, in individual altruistic utility functions, by a variation of the logarithm of total aid up to a constant factor which is this limit individual contribution.[22] This logarithmic structure is particular. Second, when this moral cost is included in the structure of the utility functions and a fiscal policy has to intervene for achieving Pareto efficiency, the general warm-glow results hold, in particular the vanishing of almost all marginal altruism as a condition for non-free-riding.

Helping because one wants to be helped when one needs it is an explicit example given by Kant of a universal rule and of a reason to want it. The more specific motive of *putative reciprocity* is also common and leads to give without the public good problem. This is: "I help them because they would have helped me if our situations were reversed, or I would have been helped by others if I needed it, or they would have helped others if they could" (respectively direct, extended and reverse reciprocity, applied hypothetically). This choice of one's behaviour given that of the others can be described by the maximization of

[21] This study presents the theory of "consistent" rules of fairness the unanimous application of which yields Pareto-efficient states. A particular form of such a general philosophy is the theory of "moral teams" presented in appendix C.

[22] For illustration, consider n identical individuals, each giving $g>0$ and having quasi-linear utility function $v(ng)-g$ with smooth concave v. The optimum and efficient g satisfies $nv'=1$. For large n, if $g\to a>0$, a constant, $v'(an)=a/an$, and hence $v=a\text{Log}(an)+b$.

one's utility function and a model of the interaction. However, there are two types of genuine reciprocity.[23] In *balance* (or *matching*) *reciprocity*, each gift tends to establish some kind of balance with the other. This leads to a warm-glow structure. In *liking reciprocity*, by contrast, one comes to like the benevolent person who gives to oneself (or to others) and to give to her because one likes her. Then the relation is simply a cause of altruism. An actual return gift of a putative balance reciprocity is no longer a contribution to a public good. It is a personal (two by two) relation with the receiver. The number of givers is irrelevant. The induced u_g^i need not vanish if the u_2^j do.[24]

Finally, cooperation resulting from repeated or sequential giving meets diriment obstacles. Giving less or not at all in order to punish another giver who failed to give at the expected level first punishes the poor still more, it punishes also all the other altruistic co-givers, and, with the large number, at any rate the actions of a "small" giver are not even noticed by other people.

10. Rebate and matching-grant neutrality or dual effects (cost or benefit)

In many places and cases, philanthropy is subsidized by tax exemptions or rebates, or encouraged by matching grants. The basic thing about these policies is that, a priori, they have no effect, if all is considered by the analysis and the agents, including with all kinds of warm-glows, external effects, etc.[25] Notably, the financing of the cost of these policies should not be forgotten. Other things equal, they are financed by taxes. This product could have been directly provided to the poor, that is, what the poor receive from taxes is diminished by this amount. Their income is in this way diminished by the matching grant they receive. Or it is diminished by the rebate or subsidy received by the giver, and the gift minus the rebate is both the cost for the giver and the *final* receipt of the poor for which the giver's choice is responsible. Hence, in all cases, when the giver chooses her gift by balancing the cost for her and the benefit for the poor, both are equal, and this amount is also what the giver or other people may directly value as her gift or as a part of her contribution.

[23] See Kolm (2008a).
[24] However, if the object of reciprocity is considered to be the gift relative to the need, the return gift may depend on other people's gifts.
[25] This conclusion in the presence of warm-glows differs from the views of Bernheim (1986) and Andreoni (1990).

In all the foregoing models, including with all the possibilities of warm-glows, external effects – utility functions with a priori the most general form (34) – and laundering, if the gift g_i of giver i is augmented by the matching grant $m_i(g_i)$ (with $m_i(0)=0$), the poor receive $g_i+m_i(g_i)$, but the taxes Σt_i finance $m_i(g_i)$ and are diminished by this amount when transferred to the poor. Hence, the poor receive $\Sigma[g_i+m_i(g_i)]+\Sigma t_i-\Sigma m_i(g_i)=\Sigma g_i+\Sigma t_i$. For rebates or subsidies, if the giver i, giving g_i, receives a rebate or subsidy of $r_i(g_i)$ (with $r_i(0)=0$), this is financed from the taxes Σt_i (perhaps, for tax rebates, by a transfer to the income tax fund for leaving other things equal), this amount Σt_i is diminished by this amount $r_i(g_i)$ when it is transferred to the poor, and the poor's benefit due to the gift g_i is only $g_i-r_i(g_i)$, which is the cost to giver i. The poor receive, on the whole, $\Sigma g_i+\Sigma t_i-\Sigma r_i(g_i)=\Sigma[g_i-r_i(g_i)]+\Sigma t_i$. All is identical to giver i deciding to give $g'_i=g_i-r_i(g_i)$. In all cases, since the taxes do not change, the same result holds if they are not lump-sum.[26]

Of course, if grants, rebates or subsidies are financed, in total or in part, from outside this system, and one forgets about their cost, or if the givers suffer from "gift illusion" and forget about this financing and its effects, other results obtain, with generally increases in the gifts.[27] Then, such a given amount generally enriches the receivers more when it is used for financing matching grants, rebates or subsidies increasing with the gift. In these cases, the cost for the giver differs from the corresponding benefit for the receivers, actually or as they are perceived. This raises, for concerns about gift or contribution in themselves, the problem of whether what matters is the giver's actual sacrifice, or the increase in the poor's benefit due to her action, or both, or some combination of both. This choice may more or less differ

[26] This is the reason of the result of Bernheim (1986) for the case of "pure altruism" (also Andreoni and Bergstrom, 1996). Andreoni (for lump-sum taxes and proportional subsidies) sees well the general logic for the case of "pure altruism", in 1988, but obtains in 1990 a different result for the general "impure altruism" case because he writes (p. 469) that the warm-glow is concerned with the individual gift g_i rather than with $g_i\cdot(1-s_i)$ – where s_i is the subsidy rate for individual i –, which is both the cost for the giver and the benefit for the receivers if the subsidy s_ig_i is financed from taxes and hence deduced from the government's transfers to the poor. This assumption probably results from the three hypotheses that the individual thinks that: the poor will receive g_i, the subsidy $s_i\,g_i$ is given from outside ("as manna from heaven"), and the relevant base for warm glow is the poor's benefit g_i (hence not reduced by the payment of $s_i\,g_i$ by taxes) and not the sacrifice the individual incurs for it $(1-s_i)\cdot g_i$ – for the items the individual is responsible for (i.e. not t_i). This differs from the assumptions of both the article of 1988 for pure altruism (concerning the financing of the subsidy), and a note mentioning a warm-glow for total sacrifice $g_i\cdot(1-s_i)+t_i$, with the neutrality resulting from the presence of the tax t_i.

[27] The givers do not "see through" the government budget in the expression of Boadway, Pestieau and Wildasin (1989).

according as whether the issue is the gift g_i or the contribution c_i.[28] It may also depend on who evaluates (the giver herself or someone else – relevant for induced warm-glows and Pareto efficiency). The results may also depend on the hypotheses about the origin of the funds (possibly part exogenous and part endogenous, etc.). They include the determination of the optimum subsidy or matching-grant schedules. The same remarks hold for moral efficiency (along the lines of sections 4 and 8.4).[29]

11. Conclusion

Trying to explain giving to the poor in the presence of fiscal redistribution, with the simple device of comparing marginal conditions, leads to the consideration of the variety of possible motives. This shows a number of a priori surprising puzzles, paradoxes, contradictions and impossibilities. The impotence of sacrifice warm-glows is not surprising since they leave the perfect substitutability between gifts and distributive taxes, but this limits the working warm-glows to the responsibility motive which is intrinsically contradictory (or to erroneous information). However, a morally laundered public objective adds the sacrifice motive to responsibility, and "external glows" explain non-crowding out by other people's desire that the giver contributes (sacrifice) less. The vanishing of almost all marginal altruism necessary to explain any gift, given the large number of people concerned, is particularly puzzling. It implies, in particular, that altruism-based warm-glows are very unlikely. The restriction to shallow warm-glows (and to the contrarian "external glows") is limitative. As a result, the social/moral reasons for contributing to public goods may be promising. However, motives of the Kantian family are prima facie inconsistent, lateral reciprocity or moral marching may require constraint to guarantee other people's contribution, and in simple sequential giving punishing defectors by providing less punishes the poor and is not efficient in large number (there are possible answers for Kantian and matching conducts). Putative balance reciprocity is a promising explanation, but would its scope be sufficient? It may also be noted that, for a number of explanations, the large number is often favourable to non-free-riding (shallow warm-glows and the social/moral motives of all types). Finally, with any motive or warm-glow, matching grants or subsidies have no effect if the people and the analysis take all their effects – and in particular their cost – into account.

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[28] For instance, more weight may be put on the cost for the giver for the contribution $c_i=g_i+t_i$ than for the gift g_i by itself, because this cost is emphasized when the relevance of the contribution is justified by the argument that the tax paid should be included.

[29] The effects of all these questions are shown in Kolm (2008b).

A consequence of this general state of the investigation is that there is doubtlessly more to be found in this domain. This would, in particular, associate further psychological analyses, their economic modelling and the derivation of their consequences, the consideration of imperfect information and policy, and the role of solidarities and charities.[30,31] This should help explaining the levels and forms of aid, the reasons for the large difference in the relative importance of public and private aid across countries (for instance in the US and in Europe), and various facts about other public goods. There are important consequences for the improvement of policy and of the various organizations of aid. The major economic, social and moral importance of fighting poverty, and in particular to permit the realization of the explicit or implicit, individual or collective, voluntary solidarity, makes the further analysis of this topic particularly commendable.

Appendix A - Pareto efficiency for sub-populations

The relation between Pareto efficiency in the two regimes is a particular case of more general properties. Let *z* denote a state, *Z* the set of possible states, $U^i(z)$ the utility function of *any* individual *i*, and *I*, I' and I'' sets of individuals *i*. Say that $z=z^*$ is *strictly Pareto efficient* for the set *I* of individuals *i* if $z^* \in Z$ and, for any $z' \in Z/\{z^*\}$, $U^i(z) < U^i(z^*)$ for at least one $i \in I$. Strict Pareto efficiency implies ordinary Pareto efficiency. Then, if z^* is strictly Pareto efficient for the population I', it is also strictly Pareto efficient for any population $I'' \supset I'$, and therefore it is Pareto efficient for this population. Note that if $W(\{U^i\}_{i \in I'})$ is a strictly increasing function which has a unique maximum on *Z* at z^*, then z^* is strictly Pareto efficient for population I', and therefore for any larger population $I'' \supset I'$, and it is also Pareto efficient for these populations. In particular, if $|I'|=1$ and I' is made of a single individual *i*, both strict Pareto efficiency for I' and this unique maximum mean a unique maximum of function U^i. This implies strict and usual Pareto efficiency for any population including individual *i*. This can result from individual *i*'s choice of z^* in the set *Z*.

[30] Classical empirical bases are provided by Clotfelter (1980), Woodward (1984), Kahneman and Knetsch (1992), Schokkaert and Ootegem (2000), Spash (2000), Schokkaert (2006).
[31] Bilodeau and Steinberg (2006) provide a synthesis of the role of charities.

Appendix B – Responsibility and information

In the real world, however, the responsibility issue may not be so clear-cut, and questions of information may play a role. Social pressures and even interiorized strong norms of giving may attenuate the person's responsibility for her gift. Moreover, a person might sometimes be considered having some responsibility for the distributive taxes she pays. This happens if these taxes have to result from a collective unanimous agreement (each person's veto gives her full responsibility for the whole of the outcome). One principle of public finance ("liberal social contracts"), in particular for financing public goods, consists of imposing the outcome from such a hypothetical collective agreement. The taxpayer's responsibility is lower if she is only a voter in a vote requiring lower unanimity, but it comes back if she fully endorses this system.

Moreover, there may be differences in information about g_i and c_i, for individual i and for other people whose opinion influences her warm-glow. Differences in information may not be relevant from a normative point of view, but they are for actual preferences and actions. The giver generally knows her gift g_i. She knows the distributive taxes she pays if they are separated from the rest of taxes. If not, she knows her direct taxes, may estimate her indirect taxes, and may derive t_i from an information about the share of the budget used to help the poor (including by public education, subsidized health care, or other programs). For the effects of the praise or blame of other people on the person's warm-glow, they may just be imagined by her, in particular for the case in which they knew what she knows. Other people may also estimate the person's gifts (she may boast about them), and the distributive tax she pays from some idea about her general taxes (perhaps from her lifestyle) and about the share of the public budget used for helping the poor.

Appendix C – Moral teams

A team is a set of persons with the same aim, notably seeking to maximize the same function (R. Radner). An agreement can be about a function to maximize. A lateral reciprocity (matching) can be seeking to maximize some function if the other participants do the same. The a priori inconsistency of conducts of the Kantian family are due to the fact that people choose "universal" acts or rules with different objectives, notably maximizing different functions such as their own utility functions. However, since "Kantian" individuals act

morally, it may be inconsistent that they do not also evaluate their choice according to a moral criterion. Indeed, Kant insists that moral conduct is not driven by the individual's tastes, that he calls "inclinations" and which includes the individual's altruism. These three social ethics can thus lead to all participants wishing to maximize some social welfare function U of form (1) with individual utility functions which are a priori of the most general form (34).[32, 33] The outcome is Pareto efficient with respect to utility functions. Each individual i chooses her gift g_i, and the g_i are independent variables. Therefore, the maximum of U is a Cournot-Nash equilibrium of the game so defined.

However, distributive taxes t_i can also be chosen. Noting $U_{g_i}=dU/dg_i$ and $U_{t_i}=dU/t_i$, the forms of u^i and U entail, with $c_i=g_i+t_i$:

$$U_{g_i}=U_{t_i}+\alpha_i \tag{44}$$

with

$$\alpha_i=\lambda_i u^i_g+\Sigma_{j\neq i}\lambda_j u^j_{g_i}=\partial U/\partial g_i. \tag{45}$$

For the g_i and t_i that maximize U, with the foregoing assumptions,

$U_{g_i}\leq 0$ with sign = if $g_i>0$,

$U_{t_i}\leq 0$ with sign = if $t_i>0$.

If the u^i_g and $u^j_{g_i}$ are not assumed all zero, for the set of g_j and t_j that maximize U, $\alpha_i\neq 0$ except fortuitously. Then U_{g_i} and U_{t_i} cannot both be zero. Hence of the gift g_i and the tax t_i, *if one exists it crowds the other out* at the highest U. Specifically, $t_i=0$ if $\alpha_i>0$ and $g_i=0$ if $\alpha_i<0$. The case $\alpha_i>0$ occurs in particular if $u^i_g>0$ and $u^j_{g_i}=0$ for all $j\neq i$; this is another aspect of $u^i_g>0$ permitting $g_i>0$. If $\alpha_i=0$, which can be seen as non-fortuitous only under the

[32] Tastes intervene, then, but not in a self-centered way. In an elaborate work, Bordignon (1990) considers in particular individuals who evaluate with their own different social evaluations, each of which assumes that other people have the evaluator's utility function (tastes) and is, then, utilitarian (it could also be a more general aggregation function, for instance a maximin which would demand ordinal utilities only). The outcome is not Pareto efficient (it is compared with an inefficient political provision). Brekke, Kverndokk and Nyborg (2003) suggest evaluation with "social welfare as I perceive it".

[33] These individuals naturally reveal their utility functions to the others.

"classical" assumptions implying $u_g^i = u_{g_i}^j = 0$ for all *i*, g_i and t_i may both be positive; in fact, they are substitutable in all respects (only $c_i = g_i + t_i$ intervenes); this amounts to individual *i* freely paying her distributive tax. In all these conditions, u_c^i and $u_{c_i}^j$ play no role.

References

Admati, A., and M.Perry. 1991. "Joint projects without commitment." *Review of Economic Statistics*, 58: 259-76.

Andreoni, J. 1988. "Privately provided public goods in a large economy: the limits of altruism." *Journal of Public Economics*, 35: 57-73.

Andreoni, J. 1989. "Giving with impure altruism: Applications to charity and Ricardian equivalence." *Journal of Political Economy*, 97: 1447-58.

Andreoni, J. 1990. "Impure altruism and donations to public goods: a theory of warm-glow giving." *Economic Journal*, 100: 464-77.

Andreoni, J., and T. Bergstrom. 1996. "Do government subsidies increase the private supply of public goods?" *Public Choice*: 88, 295-308.

Arrow, K.J. 1972. "Gifts and Exchanges." *Philosophy and Public Affairs*, 4: 343-62.

Becker, G.S. 1974. "A Theory of Social Interactions." *Journal of Political Economy*, 82: 1063-93.

Becker, G.S. 1978. "A positive theory of the redistribution of income." University of Chicago, Center for the Study of the Economy and the State Working Paper 006.

Bilodeau, M., and N. Gravel. 2004. "Voluntary provision of public good and individual morality". *Journal of Public Economics*, 88: 645-66.

Bilodeau, M., and R. Steinberg. 2006. "Donative non-profit organization." In *Handbook in the Economics of Giving, Altruism, and Reciprocity*, ed. S.-Ch. Kolm and J. Mercier Ythier, 1271-1333. Amsterdam: Elsevier North-Holland.

Bergstrom, T., L. Blume, and H. Varian. 1986. "On the private provision of public goods." *Journal of Public Economics*, 29: 25-49.

Bernheim, D. 1986. "On the voluntary and involuntary provision of public goods." *American Economic Review*, 76 (4): 789-93.

Boadway, R., P. Pestieau, and D. Wildasin. 1989. "Tax-transfer policies and the voluntary provision of public goods." *Journal of Public Economics*, 39: 157-76.

Bordignon, M. 1990. "Was Kant right? Voluntary provision of public goods under the principle of unconditional commitment." *Economic Notes*, 3: 342-72.

Brekke, K., S. Kverndokk, and K. Nyborg. 2003. "An economic model of moral motivation." *Journal of Public Economics*, 87: 1967-83.

Clotfelter, C. 1980. "Tax incentives and charitable giving: Evidence from a panel of taxpayers." *Empirical Economics*, Springer, 13(3): 319-40.

Cornes, R., and T. Sandler. 1984a. "Easy Riders, Joint Production, and Public Goods." *Economic Journal*, 94: 580-98.

Cornes, R., and T. Sandler. 1984b. "The comparative static property of the impure public good model." *Journal of Public Economics*, 54: 403-21.

Cornes, R., and Sandler. 1986. *The Theory of Externalities, Public Goods and Club Goods*. Cambridge: Cambridge University Press.

Fershtan, C., and S. Nitzan. 1991. "Dynamic voluntary provision of public goods." *European Economic Review*, 35: 1057-67.

Glazer, A., and K. Konrad. 1996. "A signaling explanation for charity." *American Economic Review*, 86: 1019-28.

Harbaugh, W. 1998a. "The prestige motive for making charitable transfers." *American Economic Review (Papers and Proceedings*), 88: 277-82.

Harbaugh, W. 1998b. "What do donations buy? A model of philanthropy based on prestige and warm glow." *Journal of Public Economics*, 67: 269-84.

Harbaugh, W.T., U. Mayr, and D.R. Burghart. 2007. "Neural responses to taxation and voluntary giving reveal motives for charitable donations." *Science*, 316(5831): 1622-25.

Holländer, H. 1990. "A social exchange approach to voluntary cooperation." *American Economic Review*, 80: 1157-67.

Kahneman, D., and J. Knetsch. 1992. "Valuing public goods: the purchase of moral satisfaction." *Journal of Environmental Economics and Management*, 22: 57-70.

Kant, I. [1785] 1907. *Fundamental Principles of the Metaphysics of Ethics*. 3rd ed. London: Longmans, (English Translation by T.K. Abott).

Kolm, S.-Ch. 1970a. *La Valeur Publique*. Paris: CNRS-Dunod.

Kolm, S.-Ch. 1970b. *L'Etat et le Système des Prix*. Paris: CNRS-Dunod.

Kolm, S.-Ch. 1971. *Le Service des masses.* Paris: CNRS-Dunod.

Kolm, S.-Ch. 1984. *La Réciprocité Générale – La Bonne Economie*. Paris: Presses Universitaires de France.

Kolm, S.-Ch. 1987. *Freedom, cores and public goods*. Paris: CERAS, n°66.

Kolm, S.-Ch. 2008a. *Reciprocity, The Economics of Social Relations*. Cambridge: Cambridge University Press.

Kolm, S.-Ch. 2008b. "Giving with subsidy illusion." Ehess Working Document.

Kolm, S.-Ch. 2008c. "The theory of rules and the moral provision of public goods." IDEP Working Document.

Kolm, S.-Ch., and J. Mercier Ythier. 2006. *Handbook in the Economics of Giving, Altruism, and Reciprocity*. Amsterdam: Elsevier North-Holland.

Konow, J. 2007. "Mixed feelings: Theories and evidence of warm glow and altruism." MPRA Paper 2727.

Marx, L., and S. Matthews. 2000. "Dynamic voluntary contribution to a public project." *Review of Economic Studies*, 64: 327-58.

Masclet, D., M. Willinger, and C. Figuières. 2007. "The economics of telethon: leadership, reciprocity and moral motivation." LAMETA Working Document 2007-08.

Olson, M. 1965. *The Logic of Collective Action*. Cambridge MA: Harvard University Press.

Peltzman, S. 1976. "Toward a more general theory of regulation." *Journal of Law and Economics*, 19: 211-40.

Rege, M., and K. Telle. 2004. "The impact of social approval and framing on cooperation in public good situations." *Journal of Public Economics*, 88 (7-8): 1625-44.

Ribar, C.D., and M.O. Wilhelm. 2002. "Altruistic and joy-of-giving motivations in charitable behavior." *Journal of Political Economy*, 110: 425-57.

Roberts. R. 1984. "A positive model of private charity and public transfers." *Journal of Political Economy*, 92: 136-48.

Roberts, R. 1987. "Financing public goods." *Journal of Political Economy*, 95: 420-37.

Schokkaert, E. 2006. "The empirical analysis of transfer motives." In *Handbook in the Economics of Giving, Altruism, and Reciprocity*, ed. S.-Ch. Kolm and J. Mercier Ythier, 127-81. Amsterdam: Elsevier North-Holland.

Schokkaert, E., and L. Van Ootegem. 2000. "Preference variation and private donations." In *The Economics of Reciprocity, Giving, and Altruism*, ed. L.A. Gérard-Varet, S.-Ch. Kolm and J. Mercier Ythier, 78-95. London: Macmillan.

Spash, C. 2000. "Ethical motives and charitable contributions in contingent valuation: empirical evidence from social psychology and economics." *Environmental Values*, 9: 453-79.

Steinberg, R. 1986. "Charitable Giving as a Mixed Public/Private Good: Implications for Tax Policy." *Public Finance Quarterly*, 14: 415-31.

Sugden R. 1982. “On the economics of philanthropy.” *Economic Journal*, 92: 341 -50.

Sugden, R. 1984. “Reciprocity: The supply of public goods through voluntary contributions.” *Economic Journal*, 94: 772-87.

Varian, H. 1994. “Sequential contributions to public goods.” *Journal of Public Economics*, 53: 165-86.

Warr, P. 1982. “Pareto optimal redistribution and private charity.” *Journal of Public Economics*, 19: 131-38.

Woodward, R. 1984. “An empirical analysis of philanthropic motivations.” Department of Economics, Middlebury.