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Redistribution and the Notion of Social Status

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Redistribution and the Notion of Social Status[*]

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Abstract

In this paper we study the impact of redistributive policies when agents can signal their relative standing by spending on a conspicuous good. In particular, we analyze how the shape of the status function − i.e. how relative standing is computed and evaluated − may affect the equilibrium outcome of the model. Our main finding is that, if status depends in a cardinal way on individuals' relative standing, then a redistribution from the rich to the poor can be Pareto improving. We identify a necessary and sufficient condition for the latter case.

Keywords: social status, relative standing, consumption externalities, redistribution, signalling, conspicuous consumption, income inequality

JEL Code: D11, D31, D62

1 Introduction

This paper deals with the evaluation of redistributive policies when agents can signal their relative standing by spending on a conspicuous good. We analyze how the shape of the status function – i.e. how people compute and evaluate their relative standing – may affect the model predictions. We find that the evaluation of redistributive policies is very sensitive to the specification of the status function.

The economic consequences of status have been a subject of economic inquiry since the work of Veblen (1899). However, for a modern formalization based on preferences, we have to wait until the notable book by Duesenberry (1949). In more recent times the theoretical literature on status has considerably grown.[1] Moreover, substantial empirical evidence has been provided which confirms that people do care about their relative standing in society.[2]

Several studies have investigated the consequences of fiscal policies in the presence of status seeking behavior. An entire chapter of Duesenberry (1949) is devoted to the issue of optimal taxation. Duesenberry proves that, if individuals care about the ratio between their consumption and a weighted average of others' consumption, then an income tax may be Pareto improving. Frank (1985b) shows that if people care about their distributional rank in the consumption of a conspicuous good then there is an inefficiently high level of conspicuous consumption; hence, taxing the conspicuous good is Pareto improving. Ng (1987) proves that taxing luxury goods desired for their value is burden-free and, hence, can generate Pareto improvements. In a series of papers Ireland (1994, 1998, 2001) obtains policy indications that are very much similar to those of Duesenberry, Frank and Ng, but derives them in a modern signalling framework where agents consume a conspicuous good in order to signal their social rank. In particular, Ireland proves that taxing the conspicuous good is always Pareto improving while taxing income reduces wasting but may also distort the labor market. Corneo (2002) shows that if people care about relative consumption then progressive income taxation may be Pareto improving (see also the recent work by Aronsson and Johansson-Stenman, 2008). In particular, he proves that implementing undistorted choices of working hours may require a progressive tax schedule and that the optimal degree of progressivity decreases with pre-tax income inequality. More recently, Hopkins and Kornienko (2004, 2007) show that, in a framework much in the spirit of Frank (1985b), income equality fosters social competition (for status) and, hence, wasteful consumption. They conclude that more income equality may be detrimental to welfare – especially for middle class people – though increasing inequality does not generate a Pareto improvement.

We contribute to the economic literature on social status by investigating how the definition of status affects the relationship between inequality, social competition and well-being. In the typical economic model, social status is granted by what an individual has – or is believed to have – *relatively* to what others have in terms of goods or assets considered important by the individual's reference population. We show that while a greater equality in the distribution of such resources increases social competition under ordinal status (Hopkins and Kornienko, 2004, 2007) – i.e. when people care

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[1]See, for instance, Akerlof (1997), Bagwell and Bernheim (1996), Becker et al. (2005), Bowles and Park (2005), Clark and Oswald (1998), Cole et al. (1992), Cooper et al. (2001), Corneo and Jeanne (1997), Fershtman et al. (1996), Fershtman and Weiss (1993), Frank (1985a), Hopkins and Kornienko (2004), Ireland (2001), Robson (1992).

[2]See Clark et al. (2008), Layard (2005), Frey and Stutzer (2000, 2002) and Luttmer (2005) for a representative list of references.

only about their rank in the distribution of the status bearing good or asset – the opposite may occur under cardinal status – i.e. when people also care about how far other people are in the relevant distribution. More precisely, we identify a necessary and sufficient condition for a redistributive policy to be Pareto improving. The intuition is the following. Under a cardinal notion of status, a lesser degree of inequality can entail a smaller value of status and, hence, can decrease the incentive to engage in wasteful social competition. If this reduction is large enough, then even those who have their income decreased may find themselves better off.

Our results partly overlap with those recently provided by Merzyn (2006).[3] He shows that, if individuals have heterogeneous tastes about the conspicuous good which is used as a wealth signal, then a greater wealth equality may go with a lesser social waste in conspicuous consumption. The intuition of this result is simple and interesting. Since individuals have both heterogeneous preferences and heterogeneous wealth, there is uncertainty about the reason why an individual buys more conspicuous good than another individual: it may be because she likes it more or because she is wealthier. As a consequence, a greater equality in wealth endowments increases the likelihood that differences in conspicuous consumption are due to different tastes, making conspicuous consumption less informative about one's wealth. Therefore, more equality reduces the prize associated with a given social position, implying that social status is a cardinal magnitude. If the described effect more than offsets the one emphasized by Hopkins and Kornienko (2004) then total waste decreases in the degree of equality and a redistributive policy is potentially welfare enhancing.

Although we also deal with the case where more equality goes with less social competition, our approach is substantially different from Merzyn's. Indeed, we totally disregard the issue of *why* social status is cardinal – we do not provide any micro-foundation of the notion of status. Instead, we investigate how the applied notion of status affects the relationship between inequality and both conspicuous consumption and well-being. This allows us to identify a necessary and sufficient condition – in a signalling framework – for a marginal redistribution in favor of the poor to be strictly Pareto improving.

The rest of the paper is organized as follows. Section 2 is divided in three parts and illustrates our modelling approach; subsection 2.1 discusses the fundamental assumptions of our model; subsection 2.2 introduces the baseline model of signalling employed throughout the paper; subsection 2.3 briefly discusses the notion of cardinal status. Section 3 is divided in five parts and provides the main results of the paper; subsection 3.1 provides a necessary and sufficient condition for a marginal redistributive policy to be Pareto improving; subsection 3.2 discusses under which circumstances the condition identified in subsection 3.1 is likely to hold; subsections from 3.3 to 3.5 explore three extensions of the baseline model showing that the quality of our main finding still holds under reasonable alternative specifications – when status is determined by resources not spent on conspicuous consumption (3.3), when conspicuous consumption has intrinsic value (3.4), and when redistribution is partly observable (3.5). Section 4 contains a few final comments and a brief summary of conclusions.

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[3]At the time of the writing of our paper we were not aware of Merzyn's interesting research. We thank two anonymous referees for having let us know about Merzyn's yet unpublished work.

2 A Signalling Model of Status

2.1 Preliminary Discussion

Although economists generally agree that social status is relevant to economic behavior, four issues regarding the economic foundations of social status are still object of a lively discussion. In order to allow a better understanding of our model we find convenient to briefly illustrate what positions we take with respect to each issue. This also allows us to clarify in what respects our contribution is relevant and in what is not.

The first issue is why people give a value to their status. An explanation is that concerns for status are hardwired into human beings (Veblen, 1899). Indeed, there are reasonable evolutionary arguments supporting the thesis that preferences which give value to one's relative standing grant a higher fitness than preferences which give value only to one's absolute standing. This has been shown to be especially likely in the case of limited cognitive capabilities and uncertain environment (Rayo and Becker, 2007; Samuelson, 2004). A more sophisticated explanation is that status is instrumental to something else, that is, it is a means to an end (Postlewaite, 1998). A classical argument in this regard is based on matching models: status may be instrumental to matching with a wealthy mate (Cole et al., 1992, 1998).

In our model we follow Hopkins and Kornienko (2004) in taking no sharp position with respect to either explanation. We assume that people strive to "keep up with the Joneses" but we do not investigate why it is so.

The second issue is what is the status-bearing object, i.e. the object whose distribution in the population is thought to determine social status. In this regard there exists a variety of positions. One, which comes from the sociological literature, points to the endowment of human capital of which education and occupation may be seen as proxies (Fershtman and Weiss, 1993; Fershtman et al., 1996). Another idea is that status depends on the current level of income or consumption, the so-called relative income hypothesis (see Clark et al., 2008, and references therein). An alternative approach posits that social status is determined by the distribution of wealth (e.g. Robson, 1992).

In our model we assume that status is given by the endowment of valuable resources one is believed to own (as in Bagwell and Bernheim, 1996). Since our model is atemporal, resources can be interpreted as either income, total consumption, or wealth. If a positive correlation between human capital and either income or wealth is assumed, then resources can also be thought of as human capital proxies. Note that we keep resources logically distinct from conspicuous consumption. While there is a plenty of evidence about individuals engaging in conspicuous consumption, we find it hard to think of conspicuous consumption as conferring status by itself. Although we do not reject the possibility that social status is hardwired into human preferences, we agree with Postlewaite (1998) that it seems at least unlikely that the relation between modern conspicuous goods and social status is also hardwired into human preferences.

The third issue is related to the second one: is the status-bearing object fully observable? This is a relevant issue because, if the status-bearing object is not fully observable, then individuals may engage in potentially wasteful signalling activities (Ireland, 1994, 2001; Bagwell and Bernheim, 1996; Cole et al., 1995; Corneo and Jeanne, 1998).

In our model we assume that the status-bearing object is not fully observable and that conspicuous

consumption is a signal for it.[4] Our argument is quite simple: we find that full observability is a rather extreme assumption for either human capital, income, total consumption or wealth.

The last issue is how one's status depends on the distribution of the status-bearing object – or, more precisely, what characteristics of the distribution determine one's social status. A popular approach is that only position matters: social status is determined by the rank occupied in the relevant distribution (e.g. Frank, 1985a; Hopkins and Kornienko, 2004; Ireland, 1994; Corneo and Jeanne, 1997; Becker et al., 2005). Alternatively, there exists a variety of status definitions which entail cardinal elements. For instance, in the seminal contribution by Duesenberry (1949) status is determined by the ratio between one's own and average consumption (see also Clark et al., 2008, and references therein); otherwise, status may depend on the difference between one's own and average value in the relevant distribution (e.g. Cooper et al., 2001; Bowles and Park, 2005). Importantly, Clark and Oswald (1998) have shown that the choice between these two cardinal options is not innocuous: if people care about the difference between values instead of caring about the ratio between values then they are more likely to show a conformist behavior than a deviating one. A further proof of the relevance of this issue is provided by Bilancini and Boncinelli (2008) where is shown that one finding from Clark and Oswald (1998) is not robust to the switch from cardinal to ordinal status and that one finding from Frank (1985b) is not robust to the switch from ordinal to cardinal status.

In our model we mostly focus on the last issue. We show how crucial is the applied notion of status for the model predictions by showing that the evaluation of a redistributive policy in favor of the poor depends on the definition of status. More precisely, we provide a necessary and sufficient condition for a marginal redistribution of the status-bearing object from the rich to the poor i) to reduce the waste in signalling for status, and ii) to increase everybody's utility. We also show that neither i) or ii) can be obtained under ordinal status.

2.2 The Model

We consider a population of two types of individuals, that we label "rich" and "poor" for simplicity and whose fractions in the population are, respectively, β and $(1 - \beta)$.[5] Hereafter, the subscript h will be used to refer to the rich (individuals with a *high* level of resources), while the subscript l will be used to refer to the poor (individuals with a *low* level of resources). Rich and poor differ only in their endowments of resources that are indicated with R_h and R_l, with $R_h > R_l$ and $R_h, R_l \in \mathbf{R}_+$. All individuals allocate resources to either the consumption of an inconspicuous good, whose price is normalized to 1, or to the consumption of a conspicuous good, whose price is p. Inconspicuous consumption is indicated with c while conspicuous consumption is indicated with x. Furthermore, we posit that both the endowments of resources and c are unobservable while x is observable.

Individual utility is assumed to be additive in two components, one measuring the utility from inconspicuous consumption, u, and another measuring the utility from status, s. Note that the conspicuous good does not generate utility directly. We make the usual assumptions about the shape of $u(c)$, namely $u' > 0$ and $u'' < 0$. For what concerns status, it is assumed to depend on

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[4]In subsection 3.5 we explore an extension of our baseline model where we assume partial observability of transfers and hence, indirectly, of the (redistributed) status-bearing object.

[5]Under the assumption that there are at least one rich and one poor the total number of agents plays no substantial role here. In particular, population may be either finite or infinite.
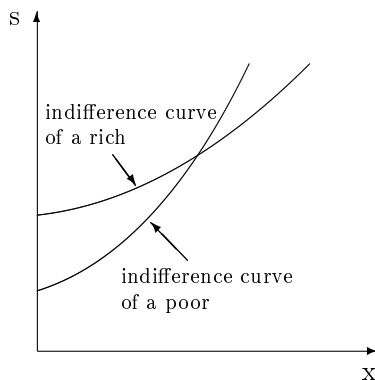
Figure 1. The shape of indifference curves.

the relative access to resources. If the amount of resources possessed by each individual were public information then status would be independent of individuals' actions. However, while the overall distribution of resources is public information – i.e. R_h, R_l and β – the amount of resources possessed by any single individual is a private information. Therefore, in order to attain status individuals have to signal their possession of resources by consuming the conspicuous good x. More precisely, status is gained depending on how the signal x is interpreted, as described by the belief function $\mu : \mathbf{R}_+ \to [0,1]$ which gives the probability, conditional on the observation of x, of being considered of type h. We assume that status translates directly into utility. Hence, we refer to $s(\mu(x))$ indifferently as either status or the utility from status. Furthermore, we assume that s is a strictly increasing function of $\mu(x)$. For notational convenience, we denote by L the status of poor, that is $L = s(0)$, and by H the status of rich, that is $H = s(1)$.

Summing up, the decision problem of the generic individual of type i, with $i = h, l$, can be described as

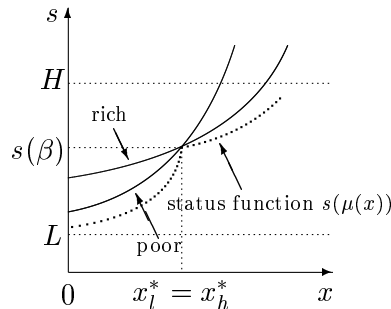$$\max_{c,x}[u(c) + s(\mu(x))], \quad \text{s.t.} \ \ R_i \geq c + px \tag{1}$$

Since $u' > 0$, the budget constraint must hold with equality. Hence, (1) can be restated as

$$\max_x[u(R_i - px) + s(\mu(x))] \tag{2}$$

The next step is to choose an appropriate equilibrium concept for the model. The definition of equilibrium that we employ is an adaptation of the standard equilibrium concept in models of signalling

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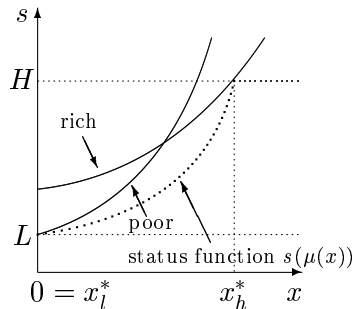
Figure 2. Separating equilibrium. **Figure 3.** Pooling equilibrium.

(see for instance Mas-Colell et al., 1995). Note that we restrict our attention to pure strategies. This simplifies the notation without modifying the substance of results.[6] A triple (x_l^*, x_h^*, μ^*) is an equilibrium if and only if

1. for $i = l, h$, $u(R_i - px_i^*) + s(\mu^*(x_i^*)) \geq u(R_i - px) + s(\mu^*(x))$ for any x

2. beliefs are consistent:

   (a) if $x_l^* \neq x_h^*$ then $\mu^*(x_l^*) = 0, \mu^*(x_h^*) = 1$

   (b) if $x_l^* = x_h^*$ then $\mu^*(x_l^*) = \mu^*(x_h^*) = \beta$

In order to get an intuitive understanding of how the model works it is useful to depict the indifference curves for both rich and poor individuals in the plane (x, s), as in figure 1. These curves are convex, since the marginal rate of substitution, $pu'(R_i - px)$, increases as x gets larger. Furthermore, and for the same reason, an indifference curve for the rich crosses an indifference curve for the poor only once and, in such a point, the former is steeper than the latter. This property, which plays a crucial role in models of signalling, is called single-crossing property.

A standard result in signalling models is the existence of two types of equilibria, namely separating and pooling. Here we have that in a separating equilibrium the rich and the poor spend different amounts of resources on signalling and that, by consistency of beliefs, they are correctly sorted out obtaining status H and L respectively. On the contrary, in a pooling equilibrium all individuals spend the same on signalling and, again by consistency of beliefs, the status function assigns to everybody the value $s(\beta)$, i.e. the status of being considered rich with probability equal to the actual frequency of rich people in the population. Figure 2 and 3 represent an instance of these two types of equilibria.

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[6]In particular, the prediction got by the intuitive criterion, which we employ subsequently, remains unchanged.
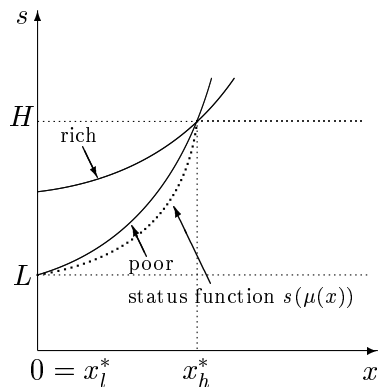
Figure 4. Equilibrium by the intuitive criterion.

Note that the status function μ can assign any value to out-of-equilibrium signals. This great freedom yields a multiplicity of both pooling and separating equilibria. In order to get a unique prediction for this model, we apply a refinement called "intuitive criterion" (Cho and Kreps, 1987) which is now acknowledged as a standard predictive tool in signalling models Riley (2001). The basic idea behind the intuitive criterion is indeed quite simple (for a formal statement we refer to Cho and Kreps, 1987): the function μ must assign 1 to whoever makes a deviation from an equilibrium strategy profile which, if made by a poor, would give to the latter a payoff lower than the equilibrium payoff even if such a deviation would have granted her the status of rich.

The application of the intuitive criterion yields as unique prediction the separating equilibrium where i) the poor spend nothing on signalling (as in all separating equilibria), ii) the rich spend on signalling the minimum amount which makes a deviation not convenient for the poor. This is is illustrated in figure 4. Formally, in the refined equilibrium the following condition must hold, where we simplify notation by letting $x^* = x_h^*$:

$$u(R_l) + L = u(R_l - px^*) + H \tag{3}$$

Condition (3) characterizes the equilibrium that we use as a reference point in our comparative statics exercise about redistribution of resources.

2.3 The Notion of Status

A part from the (loose) presumption that status depends on one's relative possession of resources, so far we have left unspecified *how* status depends on the distribution of resources in the population.

Note that, since the latter distribution has been assumed exogenous to the model, we had safely postponed such a specification. However, in order to carry out a comparative statics exercise about the redistribution of resources we have to be more precise about how s depends on the distribution of resources.

If people were only concerned with their rank in the distribution of resources, then s would only depend on β. In particular, we expect L to decrease in β and H to increase in β. However, if people care not only about being ahead of (or behind) others but also about how much ahead (or behind) they are, then s also depends on R_l and R_h. In the light of this, we conclude that the general assessment of redistributive policies in the presence of concerns for status requires a definition of social status which allows for more information about the distribution of resources than the mere rank allows for.[7]

Accordingly, we assume that the function s depends on β, R_l and R_h. The general case represents cardinal status while the special case where s does not depend upon either R_l and R_h represents ordinal status. Furthermore, let H and L be differentiable functions of both R_h and R_l. In line with intuition we assume that $L_l = \partial H/\partial R_l \geq 0$, $L_h = \partial L/\partial R_h \leq 0$, $H_l = \partial H/\partial R_l \leq 0$, $H_h = \partial H/\partial R_h \geq 0$. In other words, the status associated with being poor is not increasing in the rich's access to resources and is not decreasing in the poor's access to resources. Symmetrically, the status associated with being rich is not increasing in the poor's access to resources and is not decreasing in the rich's access to resources.

3 Results

3.1 The baseline results

We employ the model of the previous section to analyze the effects of redistributive policies in favor of the poor. Before entering this issue we make a couple of remarks. First, in order for a redistribution of resources to be considered, resources must be transferable. So far we have been vague about resources, in order not to rely on specific assumptions when unnecessary. However, not every conceivable interpretation for resources is compatible with transferability. If, for instance, by resources we refer to time endowments then this requirement looks as particularly demanding. On the contrary, if we refer to monetary wealth then the requirement seems rather plausible. Therefore, in what follows we restrict the analysis to resources which are transferable. Second, although the general working of the redistributive policy is public information, we assume that individuals can only observe their own transfers. In fact, if all transfers were observable then poor and rich people would be automatically separated by them and there would be no point in signalling. We explore the effects of the relaxation of this assumption in subsection 3.5.

In the following we consider balanced-budget redistributions, that are transfers ΔR_l and ΔR_h satisfying the following condition:

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[7]Note that, in principle, also p can affect s. If status depends on the relative possession of resources in *real terms*, then an increase in the price of the conspicuous good may decrease both the status of rich and the status of poor. The actual relation between prices and status reasonably depends on what commodities or assets are considered relevant for the determination of status (for instance, see subsection 3.3 for an extension of the model where status does not depend on resources wasted in signalling).

$$(1-\beta)\Delta R_l + \beta \Delta R_h = 0 \tag{4}$$

from which $\Delta R_h / \Delta R_l = -(1-\beta)/\beta$. For notational convenience we define $\alpha = (1-\beta)/\beta$. Furthermore, and again to simplify notation, we indicate with L_r and H_r the marginal effect of a redistribution in favor of the poor on the status of poor and the status of rich, respectively. Namely, $L_r = L_l - \alpha L_h$ and $H_r = H_l - \alpha H_h$. Note that $L_r > 0$ and $H_r < 0$.

Intuitively, a redistributive policy affects the incentive to spend on signalling by changing the *marginal opportunity cost of signalling*. In particular, because of the concavity of the utility function u, if the poor become richer their marginal opportunity cost of signalling decreases. As a consequence, the poor are willing to spend more on signalling and the rich are hence forced to waste more to differentiate themselves from the poor. However, this effect – which we may refer to as "increased social competitiveness"[8] – is not the only one: if status is cardinal the value of being considered rich relatively to being considered poor decreases when the rich become poorer and the poor become richer. This effect – which we may refer to as "decreased prize for competition" – reduces the amount of resources the poor are willing to waste in signalling and hence it makes the rich save on signalling.

A redistribution in favor of the poor raises their utility because their consumption of the useful good increases (in fact, in equilibrium they always spend zero on signalling) and, if status is cardinal, the value of being considered poor increases as well. On the contrary, the waste in signalling being equal, a redistribution makes the rich worse off because it reduces their consumption of the useful good. Moreover, if status is cardinal the value of being considered rich decreases too as a consequence of the redistributive policy. However, if the net effect between the increased social competitiveness and the decreased prize for competition allows the rich to save enough resources on signalling – more than the reduction in their level of resources due to the redistribution – then their consumption of the useful good increases and this increase might more than offset the reduction of status in terms of utility. In such a case, since the poor are definitely better off when richer, a redistribution leads to a Pareto improvement. Proposition 1 identifies a necessary and sufficient condition for it to be the case.

Proposition 1. *There exists a marginal redistribution which is Pareto improving if and only if the following condition holds:*

$$u'(R_h - px^*)\left[-\alpha + \frac{u'(R_l) - u'(R_l - px^*) + L_r - H_r}{u'(R_l - px^*)}\right] + H_r > 0 \tag{5}$$

Proof. We take the derivative of the equilibrium utility of the poor by exploiting the left-hand side of (3) and (4):

$$\frac{\mathrm{d}(u(R_l) + L)}{\mathrm{d}R_l} = u'(R_l) + L_r \tag{6}$$

Since $u'(R_l) > 0$ and $L_r > 0$, we conclude that the derivative of the equilibrium utility of the poor with respect to a redistribution in their favor is always positive.

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[8]Hopkins and Kornienko (2004, 2007) have been the first authors to precisely identify this effect. In their model, more equality in income makes the income distribution more "dense" and hence increases the marginal benefit of an additional unit of conspicuous consumption, since it allows to catch up with more individuals and attain a higher status.

Differentiating (3) in the light of (4), we obtain:

$$\frac{\mathrm{d}x^*}{\mathrm{d}R_l} = \frac{u'(R_l - px^*) - u'(R_l) - L_r + H_r}{pu'(R_l - px^*)} \tag{7}$$

Furthermore, differentiating the utility of the rich in the light of (4) and (7), we obtain:

$$\frac{\mathrm{d}(u(R_h - px^*) + H)}{\mathrm{d}R_l} = u'(R_h - px^*)\left[-\alpha - p\frac{u'(R_l - px^*) - u'(R_l) - L_r + H_r}{pu'(R_l - px^*)}\right] + H_r \tag{8}$$

Since the poor are surely better off, a redistribution yields a Pareto improvement if and only if (8) is larger than zero, that is precisely (5). □

In contrast with the results in Hopkins and Kornienko (2004), Proposition 1 states that redistributing resources from the rich to the poor can generate a Pareto improvement. When status is cardinal rich people may benefit from a redistribution in favor of the poor because such policy may reduce social competition by lowering the prize for competition – the value of being considered rich instead of poor. When status is ordinal the effect due to the decreased prize for competition disappears and the kind of results in Hopkins and Kornienko (2004) holds, suggesting the crucial role of the definition of status to appraise the effects of a redistribution. The following corollary states the point.

Corollary 1. *If status is ordinal, then any redistributive policy makes (a) the rich waste more in signalling and (b) their utility decrease.*

Proof. If status is ordinal then $L_r = H_r = 0$. By evaluating (7) and (8) when $L_r = H_r = 0$, we obtain that a marginal redistribution increases the waste in signalling and decreases the rich's utility. Since this is true for every R_l and R_h, then any redistributive policy yields the same results and we obtain (a) and (b). □

3.2 Discussion

Discussion is easier if we rewrite (5) as

$$\frac{u'(R_h - px^*)}{u'(R_l - px^*)}\left[u'(R_l) - (1+\alpha)u'(R_l - px^*) + L_r - H_r\right] + H_r > 0 \tag{9}$$

We investigate under what circumstances condition (9) is likely to be satisfied. First, let us take into consideration the dependence of functions L and H upon the levels of resources. The higher L_r and the lower H_r, the larger the reduction in the status of rich relatively to the status of poor and hence the larger the reduction in the waste in signalling. This affects positively the utility of the rich and makes (9) more likely to be satisfied. However, H_r also enters directly the utility of the rich by reducing it and, since the term $u'(R_h - px^*)/u'(R_l - px^*)$ is less than unity because of the strict concavity of u, the latter effect prevails on the former for H_r and makes its overall impact on (9) negative. This suggests that a favorable case for condition (9) to be satisfied is when the status associated with being recognized as a rich person is not much affected by R_l and R_h – i.e. H_r is close

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to zero – while the status associated with being recognized as a poor person very much depends on it – i.e. L_r is large.[9]

Second, we observe that the effect of the parameter β, and hence of α, is uncertain. By looking at (9), we note that a smaller relative numerosity of rich individuals requires a greater reduction in their resources in order to finance a redistributive policy. This is a negative effect on the utility of the rich. However, if we admit that β also affects the value of status then its overall impact remains ambiguous. For instance, if having a smaller number of rich increases the status of rich to a great extent, then this effect may more than offset the reduction in their resources due to both the redistributive policy and the increase in the relative attractiveness of the status of rich.

Third, let us consider the shape of function u. Obviously, $u'(R_l-px^*) > u'(R_l)$ and $u'(R_l-px^*) > u'(R_h - px^*)$ by the assumption that $u'' < 0$. We claim that the flatter the curve of marginal utility u', the more likely (9) to hold. Looking at the term in the square brackets of (9) we see that if $u'(R_l)$ and $u'(R_l - px^*)$ get closer, then the left-hand side of (9) increases. Furthermore, if $u'(R_h - px^*)$ and $u'(R_l - px^*)$ get closer, then the factor $u'(R_h - px^*)/u'(R_l - px^*)$ rises and, since (9) can be satisfied only when the terms within the square brackets sum up to a positive number, this increases the likelihood that (9) holds.

The last observation suggests a further interpretation of Proposition 1. In affluent societies, although the degree of inequality may be larger than in poor societies, even people with relatively low resources are likely to have their basic needs satisfied. As economic growth accumulates, we expect that the greater abundance of inconspicuous goods makes people care less and less about them. In particular, we can expect that individuals' utility functions from inconspicuous consumption have a local concavity which decreases in the affluence of society. If this is the case, then the more a society is affluent the more likely $u'(R_h - px^*)/u'(R_l - px^*)$ is to be close to unity and $(u'(R_l) - (1 + \alpha)u'(R_l - px^*))$ is to be not significantly different from zero. As a consequence, the likelihood that a redistributive policy is Pareto improving increases in the affluence of society. The story can be told as follows. In very affluent societies lots of resources are wasted in signalling because they are scarcely valued on the margin and because the difference in the opportunity cost of signalling is similar for rich and poor people. In such a case a redistributive policy has a "small" cost for the rich in terms of the utility lost by the reduction in resources and, at the same time, a "small" negative effect on the poor's opportunity cost of signalling. However, in general the redistributive policy has not a "small" effect on the reduction of the relative value of being considered rich instead of poor. Therefore, on balance, the poor are likely to find themselves less interested in the competition for status and the lower pressure for signalling reduces the amount of resources wasted by the rich. Such saving is valued in terms of the rich's utility strictly more than the reduction in their status. This is so because the same amount of resources saved makes the poor indifferent once they take into consideration not only the reduction in the status of rich but also the increase in the status of poor. In conclusion, we expect that the greater the affluence of society is the more likely the rich are to be more than compensated of their lower resources and, hence, to find themselves better off.

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[9]An interesting specification of status which meets these requirements is the so-called "relative deprivation", a concept originated in sociology with the work of Runciman (1966). According to such a notion of relative standing, individuals essentially suffer (or feel deprived) for what they do not have but others have.

3.3 Extension I: status depending on disposable income

We intentionally did not specify a particular interpretation for resources, to remark our aim to tackle the issue by looking for a common denominator between different specific approaches. However, the implicit assumption that status is not affected by the amount wasted in signalling contrasts with one of the most natural interpretation of resources, that is disposable income. In such case, status should reasonably depend on the income that is spendable on useful consumption, that is $R_h - x_h$ and $R_l - x_l$ rather than R_h and R_l. In the following we try to briefly extend along this direction.

Some concern arises because of the endogeneity of status with respect to agents' decisions of signalling. The basic model of subsection 2.2 requires a slight modification to be applied, since the flat dotted lines representing H and L in figures 2, 3 and 4 can no longer be drawn. In particular, no line can now represent the status of rich and the status of poor, instead a plane is required because status is affected by both x_h and x_l. However, skipping some distracting details, the intuitive criterion can still be applied yielding the equilibrium condition (3), where now both s_l and s_h are evaluated at $(R_l, R_h - px^*)$.

Proposition 2 is the modification of Proposition 1 for the case of status depending on disposable income.

Proposition 2. *In case of resources as disposable income, there exists a marginal redistribution which is Pareto improving if and only if the following conditions hold:*

$$-\alpha u'(R_h - px^*) + H_r + \left[u'(R_h - px^*) + H_h \right] \left[\frac{u'(R_l) - u'(R_l - px^*) + L_r - H_r}{u'(R_l - px^*) - L_h + H_h} \right] > 0 \qquad (10)$$

$$u'(R_l) + L_r + L_h \left[\frac{u'(R_l) - u'(R_l - px^*) + L_r - H_r}{u'(R_l - px^*) - L_h + H_h} \right] > 0 \qquad (11)$$

Proof. We proceed analogously to the proof of Proposition 1. (7) becomes

$$\frac{\mathrm{d}x^*}{\mathrm{d}R_l} = \frac{u'(R_l - px^*) - u'(R_l) - L_r + H_r}{pu'(R_l - px^*) - pL_h + pH_h} \qquad (12)$$

In the light of (12), (6) is replaced by

$$\frac{\mathrm{d}(u(R_l) + L)}{\mathrm{d}R_l} = u'(R_l) + L_r - pL_h \left[\frac{u'(R_l - px^*) - u'(R_l) - L_r + H_r}{pu'(R_l - px^*) - pL_h + pH_h} \right] \qquad (13)$$

and (8) is replaced by

$$\frac{\mathrm{d}(u(R_h - px^*) + H)}{\mathrm{d}R_l} =$$
$$-\alpha u'(R_h - px^*) + H_r - p \left[u'(R_h - px^*) + H_h \right] \left[\frac{u'(R_l - px^*) - u'(R_l) - L_r + H_r}{pu'(R_l - px^*) - pL_h + pH_h} \right] \qquad (14)$$

By setting (14) larger than zero we find the condition under which the rich are better off and (10) is obtained. By setting (13) larger than zero we find the condition under which the poor are better off and (11) is obtained. □

From a qualitative point of view we can still assert that a redistribution in favor of the poor can be Pareto improving. However, we are now not ensured that the poor benefit from a redistribution. In particular, if the rich's disposable income increases and if the status of poor is very reactive to it – that is L_h is very large – then a redistribution can decrease the utility of the poor. Paradoxically, there is the possibility that a redistribution in favor of the poor makes the rich better off and poor worse off. Furthermore, we can note that the adjustment in the equilibrium level of signalling resulting from a redistribution is smaller in (12) than in (7), because an increase in x^* is now more effective since it reduces not only the utility from consumption but also the value of the status of rich relatively to the status of poor. Finally, by comparing (10) and (5) we observe that any change of resources available to inconspicuous consumption now affects the utility of the rich not only through changes in utility from c, but also through changes in the value of the status of rich.

3.4   Extension II: signalling with intrinsic utility

A simplifying assumption used in the baseline model is that x is an intrinsically useless good. This would be a severe limitation if the result in Proposition 1 crucially relied on this assumption. In fact, many examples of signalling good are reasonably source of intrinsic utility. For instance, a car can be used for transport as well as to signal status. In this subsection we show that the result is essentially robust to regular utility depending on both types of consumption, inconspicuous c as well as conspicuous x. Within this subsection we suppose that, in the absence of signalling, c and x are normal goods and that the utility function $u(c, x)$ is strictly concave. We indicate with u_c and u_x the derivatives of the utility function with respect to its arguments.

In order to employ the intuitive criterion, we have to face a small complication. The source of problems, as suggested by figures 5 and 6, is that indifference curves are now initially downward-sloping. If the amount of x maximizing u did not depend on R, then a simple horizontal translation of the origin would be sufficient to solve the problem. However, given the assumption of normality, the optimal consumption of x in the absence of signalling is higher for the rich, and this optimal level of x may be high enough to make its adoption disadvantageous for the poor. The same reasoning applied for the intuitive criterion would lead us to conclude that in such a case signalling is unnecessary.

We indicate with $\hat{x}$ the optimal consumption of x for the poor in the absence of signalling. If we restrict our analysis to cases of proper signalling, that is looking at figure 6 when the indifference curve of the poor passing through $(\hat{x}, L)$ crosses the dotted line corresponding to H in a point where the indifference curve of the rich is upward-sloping, then the application of the intuitive criterion yields the equilibrium condition (3), with $u(R_l - p\hat{x}, \hat{x})$ and $u(R_l - px^*, x^*)$ instead of $u(R_l)$ and $u(R_l - px^*)$ respectively.

Proposition 3 makes the same exercise of Proposition 1 in case of signalling with intrinsic utility and reaches the same qualitative result: a redistribution in favor of the poor can be Pareto improving if the decreased prize for competition is sufficiently stronger than the increased social competitiveness.

Proposition 3. *In case of signalling with intrinsic utility, if*

$$pu_c(R_h - px^*, x^*) - u_x(R_h - px^*, x^*) > 0 \tag{15}$$

then there exists a marginal redistribution which is Pareto improving if and only if the following

condition holds:

$$-\alpha u_c(R_h - px^*, x^*) + H_r +$$
$$+[pu_c(R_h - px^*, x^*) - u_x(R_h - px^*, x^*)]\left[\frac{u_c(R_l - p\hat{x}, \hat{x}) - u_c(R_l - px^*, x^*) + L_r - H_r}{pu_c(R_l - px^*, x^*) - u_x(R_l - px^*, x^*)}\right] > 0 \quad (16)$$

Proof. (15) requires that the indifference curve of the rich passing through (x^*, H) is upward-sloping. This allows us to proceed analogously to the proof of Proposition 1. (7) becomes

$$\frac{\mathrm{d}x^*}{\mathrm{d}R_l} = \frac{u_c(R_l - px^*, x^*) - u_c(R_l - p\hat{x}, \hat{x}) - L_r + H_r}{pu_c(R_l - px^*, x^*) - u_x(R_l - px^*, x^*)} \quad (17)$$
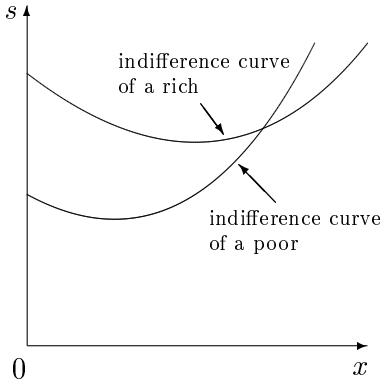
(6) is replaced by

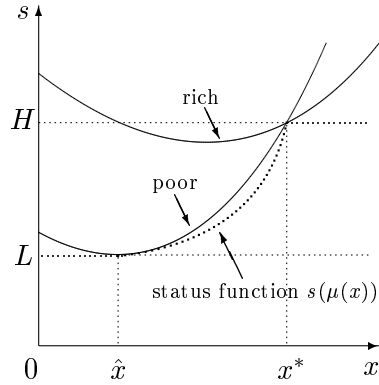$$\frac{\mathrm{d}(u(R_l - p\hat{x}, \hat{x}) + L)}{\mathrm{d}R_l} = u_c(R_l - p\hat{x}, \hat{x}) + L_r \quad (18)$$

and (8) is replaced by

$$\frac{\mathrm{d}(u(R_h - px^*, x^*) + H)}{\mathrm{d}R_l} = -\alpha u_c(R_h - px^*, x^*) + H_r +$$
$$+[pu_c(R_h - px^*, x^*) - u_x(R_h - px^*, x^*)]\left[\frac{u_c(R_l - p\hat{x}, \hat{x}) - u_c(R_l - px^*, x^*) + L_r - H_r}{pu_c(R_l - px^*, x^*) - u_x(R_l - px^*, x^*)}\right] > 0 \quad (19)$$

(18) establishes that the poor are definitely better off, while by setting (19) larger than zero we find the condition under which the rich are better off as well and (16) is obtained. □

Figure 5. Indifference curves with intrinsic utility.

Figure 6. Intuitive criterion with intrinsic utility.

Once attention is restricted to cases of proper signalling – that is when (15) holds – Proposition 3 looks very similar to Proposition 1. By comparing (16) and (5) we see that the major difference is that, when differentiating with respect to x^*, we have now to take into account the effects on both arguments of the utility function, and hence $pu'(R_h - px^*)$ and $pu'(R_l - px^*)$ are replaced by $pu_c(R_h - px^*, x^*) - u_x(R_h - px^*, x^*)$ and $pu_c(R_l - px^*, x^*) - u_x(R_l - px^*, x^*)$ respectively. To remark the close similarity between the two propositions we note that $pu_c(R_h - px^*, x^*) - u_x(R_h - px^*, x^*) < 0$ and $pu_c(R_l - px^*, x^*) - u_x(R_l - px^*, x^*) < 0$ by strict concavity of u and $u_c(R_l - p\hat{x}, \hat{x}) - u_c(R_l - px^*, x^*) < 0$ by strict concavity of u and normality of goods. Therefore, the signs of such three terms in (16) are the same as their counterparts in (5), i.e. $u'(R_h - px^*)$, $u'(R_l - px^*)$ and $u'(R_l) - u'(R_l - px^*)$, respectively.

3.5 Extension III: partially observable transfers

In order to redistribute resources from the rich to the poor, a public authority must possess all private information about individual resources. If such public authority might disclose all that information, no signalling issue would emerge and efficiency would be recovered. However, a very high cost is likely to be sustained in order to make the whole of information directly available to any individual. Moreover, in many legal systems this would presumably involve a violation of privacy legislation. Even if direct delivery of information is unfeasible, the same result would be reached if transfers were observable, since the type of transfers separates the rich from the poor. In what follows we consider partial observability, that is transfers that are observable only with some probability, and we show how the baseline model can be adapted to deal with this case.

We suppose that the probability γ that a transfer is observable depends on how much resources are redistributed. In particular, γ is equal to zero when no redistribution occurs and rises when transfers get larger. Fixed the amount of transfers – and hence fixed γ – let R_h and R_l be the resources available after the redistribution respectively to rich and poor people. Every rich individual choosing x gains a utility of $u(R_h - px) + s(\mu(x))$ with probability $(1 - \gamma)$ and $u(R_h - px) + H$ with probability γ. We define analogously the payoffs of every poor individual. We suppose that agents behave as expected utility maximizers. It is intuitive that the higher γ, the lower the expected benefits from signalling. This affects our model of subsection 2.2 in a simple way. The indifference curves in the plane (x, s) become steeper, since the marginal rate of substitution is $pu'(R_i - px)/(1 - \gamma)$, with $i = l, h$. The equilibrium condition (3) can be rewritten as

$$u(R_l) + L = u(R_l - px^*) + (1 - \gamma)H + \gamma L \tag{20}$$

In Proposition 4 we show how Proposition 1 can be slightly adjusted to consider partially observable transfers.

Proposition 4. *In case of transfers that are partially observable, there exists a marginal redistribution which is Pareto improving if and only if the following condition holds:*

$$u'(R_h - px^*) \left[-\alpha \frac{u'(R_l) - u'(R_l - px^*) + (1 - \gamma)(L_r - H_r) + \gamma'(H - L)}{u'(R_l - px^*)} \right] + H_r > 0 \tag{21}$$

Proof. We proceed analogously to the proof of Proposition 1. (7) becomes

$$\frac{\mathrm{d}x^*}{\mathrm{d}R_l} = \frac{u'(R_l - px^*) - u'(R_l) - (1-\gamma)(L_r - H_r) - \gamma'(H-L)}{pu'(R_l - px^*)} \tag{22}$$

the derivative of the equilibrium utility of the poor remains as in (6). Finally, (8) is replaced by

$$\frac{\mathrm{d}(u(R_h - px^*) + H)}{\mathrm{d}R_l} =$$
$$u'(R_h - px^*)\left[-\alpha - p\frac{u'(R_l - px^*) - u'(R_l) - (1-\gamma)(L_r - H_r) - \gamma'(H-L)}{pu'(R_l - px^*)}\right] + H_r \tag{23}$$

Since the poor are surely better off by (6), we are left to set (23) larger than zero and obtain the condition under which the rich are better off as well, that is (21). $\qquad\square$

By looking at (21) compared to (5), two differences are worth being commented. First, the larger the initial redistribution, the larger the probability that transfers are observed and signalling is ineffective, the lower the negative impact of $L_r - H_r$ on $\mathrm{d}x^*/\mathrm{d}R_l$. Second, a marginal redistribution now yields a marginal increase in γ, and this makes signalling less effective so reducing the waste in signalling by the rich. If the former effect is dominated by the latter one then, when transfers are partially observable, a marginal redistribution is more likely to be desirable.

4   Conclusions

In this paper we have studied the effects of redistributive policies in a simple model where agents use conspicuous consumption to signal their social status, under the assumption that social status depends on the relative possession of resources which are spendable in the market. As pointed out by Hopkins and Kornienko (2004, 2007), a greater income equality enhances social competitiveness by making it simpler to outperform other individuals in terms of conspicuous consumption. We have shown that, if status is ordinal, then a greater social competitiveness necessarily results in a greater amount of inefficient signalling; however, if status is cardinal, then a redistribution in favor of the poor can be beneficial to everybody. Indeed, when status is cardinal a greater equality has an additional positive effect which may more than offset the increased social competitiveness: the prize of the competition for status gets smaller and, as a consequence, people have less incentive to compete in conspicuous consumption. We have made these claims precise by providing a necessary and sufficient condition for a marginal redistribution in favor of the poor to reduce the waste in signalling and to be strictly Pareto improving. Furthermore, we have explored the robustness of our finding under reasonable extensions of our baseline model. Although some differences actually arise, we have found that the quality of our main result still holds.

Our contribution is relevant under two different respects. In the first place, it helps to correctly interpret the findings of Hopkins and Kornienko (2004, 2007) about the relationship between income equality and competition for status. While Hopkins and Kornienko are very precise in stating that their results do not imply that more equality (or a redistribution in favor of the poor) is necessarily undesirable, they do stress the fact that in order to reduce inequality we must accept, *ceteris paribus*, a greater waste in conspicuous consumption. We have shown that such a cost of reducing inequality

is not guaranteed in general but arises when social status is not very reactive to differences in the possession of resources. Two conclusions can be drawn from this. First, by itself the presence of status concerns does not make a redistributive policy less desirable. Second, the desirability of a redistributive policy as a means to reduce the waste in signalling can be evaluated only if we have good information about how social status is defined.

In the second place, our result shows that the definition of social status can make a great difference for the model predictions. Indeed, in the case dealt with in this paper we have that, depending on what is considered relevant for the determination of people's relative standing in society, a policy can worsen the inefficiencies due to status seeking behavior or be a good corrective for them. In our opinion this finding greatly reinforces the message conveyed by Bilancini and Boncinelli (2008): in models where people are assumed to be concerned with social status, the applied definition of status should be carefully discussed and motivated. This fact is not always recognized by economists working on status-related issues. In a recent and interesting investigation about the relationship between inequality, happiness and social status, Hopkins (2008) provides several examples suggesting that whether status is ordinal or cardinal does not matter for the relationship between inequality and happiness. The present paper proves that, at least when status is signalled through conspicuous consumption, whether status is ordinal or cardinal does matter for the relation ship between inequality and happiness.

One further remark is worth making. Although our conclusions are quite robust with reference to the implications of status concerns for the evaluation of redistributive policies, they are definitely not robust with reference to the evaluation of redistributive policies in general. In fact, we have abstracted from many features of real world economies which play an important role in determining the effects of redistributive policies (e.g. production is absent, there are only two goods, transfers are made at no cost, prices are exogenous, etc.). Our contribution to the general debate about redistributive policies is to have shown that a policy-maker who wants to correctly judge this kind of policies has to take into account that *any* change in the distribution of resources possessed by individuals can affect their social status and, hence, their incentive to waste resources in conspicuous consumption.

We conclude by discussing possible lines of future research. A straightforward follow up of the present study is to review models incorporating concerns for status that focus on issues other than redistributive policies and to test their predictions with respect to different specifications of the status function. Another line of research addresses the question of which notion of status best represents people's concerns for relative standing. We are convinced that this question requires an empirical answer, though we are aware that the empirical investigation of social constructs may encounter substantial technical and methodological difficulties. To the best of our knowledge, so far there have been only two attempts to test the appropriateness of competing notions of status. The first is by Brown et al. (2005) and provides supportive evidence of the so-called Range-Frequency Theory (RFT) (Parducci, 1965, 1995). RFT states that people care about two things only: their rank in the relevant distribution and the support of the relevant distribution. We emphasize that RFT entails cardinal status (in terms of our model we have that $H_i \neq 0$, $L_i \neq 0$, $i = h, l$). The other study is Clark et al. (2007) which finds that, with respect to the relevant income distribution, income rank is a better predictor of work effort than average income. This suggests that an ordinal specification of status is more adequate than a cardinal specification which considers only deviations from the mean. We think that the next step in this research direction should be to test an ordinal specification of

the status function against several cardinal ones in order to identify which features of the relevant distribution play a significant role.

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