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ANALYSIS

Status-seeking and material affluence: evaluating the Hirsch hypothesis

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Abstract

When individuals hold a preference for high relative consumption, competition to achieve social status can lead to inefficiently high levels of production and consumption, contributing to natural resource depletion and environmental degradation. In the 1970s, Fred Hirsch argued that an increasing portion of expenditure is allocated to status-seeking as average income rises. This paper critiques this hypothesis from two points of view. First, we note examples from the historical and anthropological literatures suggesting that status-seeking is often important in societies with relatively low incomes. Second, we consider a set of analytical models that focus on the economic consequences of status-seeking. When social status is defined in terms of the algebraic difference between an individual's consumption of a status good and the average consumption level in society, Hirsch's hypothesis holds true, and growth in the level of productivity and output can lead to declines in human welfare. If, on the other hand, status is linked to the ratio of individual and average consumption, Hirsch's hypothesis is valid only if social status and non-status goods are poor substitutes. The paper also considers two cases in which social status is defined in terms of the amount of time people devote to status-oriented activities. Under this assumption, productivity growth leaves time use unchanged, though the value of time devoted to status signaling increases in proportion to total expenditure.
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1. Introduction

The notion that people's preferences are independent of prevailing social conditions is a common assumption in economic models. In such models, the consumption of market goods and services yields pure private benefits, and economic growth contributes unambiguously to human wel-

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fare. This assumption, however, is in strong tension with empirical data from social surveys and contingent choice studies. Easterlin (1974) (see also Kahneman et al., 1999), for example, found that individuals' life satisfaction or 'subjective well-being' was more closely tied to their relative economic status than to their absolute incomes. Similarly, Solnick and Hemenway (1998) (see also Johansson-Stenman et al., 2000) found that survey respondents would willingly accept reductions in their personal incomes in exchange for increases in their relative rank in the income distribution. In an in-depth review of this evidence (Brekke and Howarth (2000, see also Brekke and Howarth, 2002) conclude that people's concern for variables such as relative income and relative consumption is tied to the theory of symbolic interactionism in anthropology and social psychology (Douglas and Isherwood, 1979; Dittmar, 1992). According to this theory, the satisfaction derived from goods depends on the meanings attached to them in a person's community. In a wealthy society, higher consumption levels are required to achieve a favorable self-image or to 'fit in' with respect to one's peer group.[1]

In ecological economics, authors such as Daly (1977, 1996) and Durning (1992) argue that people's concern for social status generates excess levels of economic activity and, by extension, natural resource depletion and environmental degradation. To explore this idea, Howarth (1996) considered a formal model that embodied relative consumption effects and an environmental externality. In this model, status-seeking imposes negative externalities that cause people to work too hard and consume too much when judged by the criterion of economic efficiency. Correcting this market failure requires a consumption tax to balance the private benefits and social costs of individual behavior. In addition, Howarth showed that relative consumption effects can lead individuals to overvalue consumption and undervalue the environment. Accordingly, conventional measures of willingness-to-pay may understate the full social benefits of nonmarket goods. Brekke and Howarth (2000) extend this reasoning and apply it to debates over climate change and Environmental Kuznets Curves in the context of analytical and numerical models.

In this paper, we focus attention on a narrower but in our view quite important research question: How does economic growth affect the intensity of status-seeking in competitive economies? This question was posed and provisionally answered in the seminal work of Hirsch (1976), who argued that the share of total expenditure devoted to status competition should generally increase with the level of material affluence. As is well recognized in ecological economics, resource depletion and environmental degradation are closely tied to the prevailing levels of production and consumption. Although certain environmental indicators such as urban air quality and water quality in river basins seems to improve once an economy reaches a certain income level (Grossman and Krueger, 1995), indicators such as energy use, waste generation, and greenhouse gas emissions appear to increase smoothly with the level of affluence (Rothman and de Bruyn, 1998).[2] If Hirsch's hypothesis were correct, then status-seeking would contribute substantially to the problem of overconsumption in the world's richest nations (see Sachs et al., 1998), and consumption levels could be reduced significantly without accompanying reductions in the quality of life.

As we shall see, however, Hirsch's hypothesis depends critically on empirical assumptions that may or may not be satisfied in the real world. In the next section, we discuss qualitative evidence suggesting that status-seeking may lead to wasteful consumption practices even in low-income, preindustrial societies. In Sections 3 and 4, we develop this point through the analysis of a set of formal

[1] The economics of social status has been an active topic in the recent literature. See Bisin and Verdier (1998), Cole et al. (1992), Corneo and Jeanne (1998), Postlewaite (1998), Schor (1998) and Weiss and Fershtman (1998) for contrasting perspectives.

[2] Interestingly, status competition can generate inefficiently high levels of consumption and pollution even when economic growth leads to declines in pollution (Brekke and Howarth, 2002).

models in which economic behavior is motivated in part by a concern for social status. In these models, the Hirsch hypothesis is sensitive to two key assumptions: the degree to which people perceive pure consumption and social status as viable substitutes, and the way that social status is related to one's consumption or possibly leisure.

2. The Hirsch hypothesis

In his book Social Limits to Growth, Hirsch (1976) argued that 'as the level of average consumption rises, an increasing portion of consumption takes on a social as well as an individual aspect. That is to say, the satisfaction that individuals derive from goods and services depends in increasing measure not only on their own consumption but on consumption by others as well' (Hirsch, 1976, p. 2). One of the social aspects of consumption that Hirsch was concerned about was that of status-seeking, in which individuals use consumption as a means of achieving social status: '[G]oods and services sharing some or all of the characteristics of positional goods attract an increasing proportion of family expenditure as family income rises' (Hirsch, 1976, p. 28).[3]

Frank (1999) collects a variety of examples of luxurious consumption, arguing that these observations are 'consistent with the widespread impression that a large and growing share of spending in the United States has been flowing towards high-end goods and services' (p. 32). The idea that people's concern for social status becomes increasingly important as the general level of income in society grows is intuitively appealing: In poor societies, the urgent demand is to satisfy basic needs. As material goods become more abundant, basic needs are satisfied, and people may start to care relatively more about their social position and relative economic status. According to Frank (p. 32), 'With our fundamental needs for food and shelter now largely satisfied, it is only natural that we spend more and more on luxuries as our incomes continue to grow.'

To understand this reasoning, it is useful to recall the common assumption that the marginal utility of consumption is a decreasing function of income. Hence the incremental benefit of consumption should decline as a person or a society becomes more affluent. But since positional goods and social status are relative concepts, the relative position of a typical member of society remains unchanged during the process of economic growth. One individual—or a group of individuals—can improve her social status, but everybody cannot simultaneously do so. Thus, it may seem reasonable to believe that as average income increases, social status may rise in importance as a behavioral motivation.

Following this line of thought, one would expect that phenomena such as excessive spending of resources in a rat-race for status (with environmental degradation and exhaustion of natural resources as possible side effects) would be found primarily in rich societies. This view, for example, is expressed by Stigler and Becker (1977), p. 89) in their discussion of households' spending on goods and services to achieve social distinction:

> ''[A]n increase in all incomes induces an even greater increase in *i*'s contribution to his distinction than does an increase in his own income alone. For an increase in the income of others lowers *i*'s social environment because they spend more on their own distinction; the reduction in his or her environment induces a further increase in *i*'s contribution to his or her distinction. Consequently, we expect wealthy countries like the United States to pay more attention to fashion than poor countries like India, even if tastes were the same in wealthy and poor countries.''

Numerous historical and anthropological studies, however, show that status-seeking behavior is common in societies with comparatively low consumption levels. Recall, for example, Adam Smith's passage in the Wealth of Nations (Smith, 1776, Book V, Chapter II) in which he points out

[3] Here, 'positional goods' are goods that are acquired or consumed in order to obtain some kind of social position.

that the English of his day would be 'ashamed to appear in public' without wearing leather shoes and linen shirts. In this perspective, the important aspect of one's clothing was not just whether it was warm and comfortable, but also the effect it might have on one's social status. Other examples can be found in ethnographic studies of so-called 'gift economies,' where the receipt of a gift imposes a duty to repay the donor with a gift of equal or greater value (Mauss, 1954). The failure or inability to meet this obligation diminishes the perceived status of the recipient and enhances the prestige of the gift-giver. In such societies, individuals face strong incentives to accumulate wealth in the pursuit of relative rank. An extreme version of this behavior is the potlatch ritual of the Kwakiutl people of the Pacific Northwest, in which tribal leaders gave away or even destroyed wealth to establish prestige. As described in Boas' ground-breaking ethnographic study Boas (1897, p. 353),

> "The rivalry between chiefs and clans finds its strongest expression in the destruction of property. A chief will burn blankets, a canoe, or break a copper, thus indicating his regard of the amount of property destroyed and showing that his mind is stronger, his power greater, than that of his rival. If the latter is not able to destroy an equal amount of property without much delay, his name is 'broken.' He is vanquished by his rival and his influence with his tribe is lost, while the name of the other chief gains correspondingly in renown."

A related example was provided by an anonymous referee, who pointed out that the palaces and villas of the European Renaissance 'display incredible luxury in their "public" parts as compared with hardly any comfort in their private quarters.' While these examples differ in terms of their cultural context, they indicate that considerable resources are spent to achieve status even in societies with comparatively low standards of living. On the other hand, the hypothesis that concern for status increases with the general income level might still hold: social status could, of course, be even more important to people in richer societies.

3. A formal model

In this section, we explore a theoretical model in which income growth may or may not lead to increases in the share of income devoted to status-seeking, even when the marginal utility of consumption declines to zero as the consumption level approaches infinity. In this model, an incremental unit of consumption would provide very little direct utility to a rich person. But since the effective cost of improving one's status increases during the process of economic growth, more consumption is needed to win the contest for status in a wealthy society. It is the relative size of these effects that determines whether growth augments the proportion of expenditure spent on status-seeking as suggested by the Hirsch hypothesis.

Our approach is related to the work of Congleton (1989) and Rauscher (1992), who note that increased consumption of status goods by others poses mixed incentives for an individual's own consumption of status goods. On the one hand, the marginal utility of status goods increases since the individual's own status decreases, but at the same time the marginal cost of attaining status may increase. In the current paper we will extend this result by considering the case in which average consumption is determined endogenously as a function of the prevailing level of labor productivity. This also allows us to consider the welfare effects of economic growth in the presence of concern for relative standing.

For the purpose of simplification, our model does not explicitly explore the links between production, consumption, and environmental quality. As we noted above, however, it is natural to assume that increased consumption leads to increased resource use and environmental degradation. In this sense, we believe our analysis sheds meaningful light on the environmental impacts of status-seeking.

In our model there are two consumption goods: c_1 and c_2. We interpret c_1 as a pure consumption

good that does not confer social status, while c_2 is a source of status, which does not yield direct consumption benefits. This is a somewhat extreme assumption. The wealth destroyed in the potlatch ritual provides an example of a good like c_2. Generally, however, most status-related consumption goods will presumably also yield some direct utility. For example, while driving a Porsche might give one a higher social status than driving a cheaper and more ordinary car, the Porsche would probably also give a more comfortable or exciting driving experience. However, a complete separation of status and consumption benefits simplifies the analysis, although such separation is not crucial for the main results.

We assume that the same resource c can be used for both status and consumption purposes, but that one can easily distinguish between the two uses. In this setting, c_1 corresponds to the amount of resources a person uses for direct consumption, while c_2 denotes resources that are devoted to status signaling (for example, destroyed in a potlatch). We assume a technology in which each person produces an amount of material goods c that is proportional to the amount of labor she supplies. In formal terms, the production function may be written in the form:

$$c = c_1 + c_2 = wL \tag{1}$$

where, L is the labor supply (or time spent working) and w is a positive parameter that defines the productivity of labor. The model could be altered to include environmental quality by assuming, for example, that economic activity generated pollutant emissions that were proportional to output or consumption. All variables are measured in per capita terms. In addition, we stipulate that:

$$T = l + L \tag{2}$$

where, T is the total time available to the individual and l is leisure time, which is assumed to enter the utility function.

In this model, a person's status depends on the amount of resources she devotes to status signaling in comparison with the average in her peer group. If status can be achieved through consumption, then, it seems reasonable to follow Duesenberry (1949) and model status as a function of relative consumption so that:

$$s = \frac{c}{\bar{c}_2} \tag{3}$$

where, $\bar{c}_2$ is the average consumption of good 2 in society as a whole. For later reference, let us denote this specification of the status function as 'Case 1.' Each individual regards $\bar{c}_2$ as an economy-wide variable that is beyond his or her personal control, disregarding the impact on average consumption of changes in his or her individual consumption.

To streamline the analysis, we formally assume that all individuals are identical and receive the same income. Given this assumption, the status consumption of each person is equal to the social average so that:

$$c_2 = \bar{c}_2 \tag{4}$$

in equilibrium. The assumption that individuals are identical may seem implausible when discussing status competition, which in reality is marked by class differentiation and social stratification. This assumption, however, simplifies the formal analysis and is not essential to our results; our model can, in fact, be interpreted as a simplified version of an underlying model with heterogeneous consumers. Brekke and Howarth (2002), for example, present a model in which heterogeneous individuals signal their sense of personal success through expenditures on expensive homes. They demonstrate that, under certain technical restrictions, this model is behaviorally equivalent to a model in which identical agents hold a preference for high relative housing expenditures.

As we noted above, the consumption of good 2 provides no direct utility. For the moment, we assume that each individual's utility function takes the logarithmic form:

$$U = \alpha_c \ln(c_1) + \alpha_s \ln(s) + \alpha_l \ln(l) \tag{5}$$

where, α_c, α_s, and α_l are positive constants. A rational person would seek to maximize her utility subject to the constraints embodied in Eqs. (1)–(3). This mode of behavior yields the first-order conditions:

$$\frac{c_1}{\alpha_c}=\frac{c_2}{\alpha_s}=\frac{wl}{\alpha_l}=\frac{wT}{\alpha_c+\alpha_s+\alpha_l} \tag{6}$$

that characterize consumer behavior in the context of our model.

According to Eq. (6), the share of consumption that is allocated to the status good is:

$$\frac{c_2}{c}=\frac{\alpha_s}{\alpha_s+\alpha_c} \tag{7}$$

This expression is a fixed constant that is independent of labor productivity and hence the potential earnings achievable by each person. Given the logarithmic utility function, this ratio is also independent of the average consumption level. In this model, labor productivity defines the aggregate wealth of society. Hence the share of material goods used for status signaling is independent of the prevailing level affluence, and the consumption of both c_1 and c_2 is proportional to w. Under these assumptions, positional goods do not 'attract an increasing proportion of family expenditure as family income rises' (Hirsch, 1976, p. 28).

The intuition between this result may be developed as follows. Note that the marginal utility of good 1, $\partial u/\partial c_1=(\alpha_c+\alpha_s+\alpha_l)/wT$, decreases with w, while the marginal utility of social status is fixed at the level $\partial u/\partial s=\alpha_s$. But with logarithmic utility, this increasing disparity in marginal utility is exactly offset by increasing cost of attaining status, as $\partial s/\partial c_2=1/\bar{c}_2=(\partial u/\partial c_1)/\alpha_s$. A dollar spent on status goods gives the same utility as a dollar spent on ordinary consumption, which seems to contradict the claim that 'the satisfaction that individuals derive from goods and services depends in increasing measure not only on their own consumption but on consumption by others as well' (Hirsch, 1976, p. 2).

Finally, Eq. (6) implies that $l=\alpha_l T/(\alpha_c+\alpha_s+\alpha_l)$ so that the amount of leisure that individuals enjoy is constant and independent of the marginal productivity of labor. In addition, the social status of a typical person is constant at the level $s=c_2/\bar{c}_2=1$ since (for this person) the consumption of good 2 (c_2) must be equal to the average consumption level ($\bar{c}_2$). Since increases in labor productivity augment the level of pure consumption (c_1) while leaving s and l unchanged, productivity growth leads to unambiguous improvements in consumer welfare given the preferences embodied in the utility function.

It is important to note, however, that this economy is inefficient in the sense that people's utility would be unchanged if the level of status consumption was reduced for all members of society. In this economy, welfare would improve if resources were reallocated from status competition to facilitate increased leisure or the consumption of good 1. If one assumes that the production and consumption of good 2 contributes to natural resource depletion and environmental degradation, it follows that environmental quality could be improved without sacrificing economic welfare (see Howarth, 1996; Brekke and Howarth, 2002).

3.1. Substitutability between status and consumption

It is straightforward to generalize the analysis to allow for the constant elasticity of substitution (CES) utility function:

$$U=(\alpha_c c_1^{\gamma}+\alpha_s s^{\gamma}+\alpha_l l^{\gamma})^{1/\gamma} \tag{8}$$

In this expression, γ is a fixed parameter that assumes a value that is less than one, while α_c, α_s, and α_l are all positive constants. The logarithmic utility function arises in the special case where $\gamma=0$. Under this specification, the elasticity of substitution between pure consumption and social status is $\sigma=1/(1-\gamma)$. This elasticity measures the degree to which individuals can exchange between consumption, social status, and leisure while maintaining a given level of utility. For low values of σ, these goods are complements that people aim to consume in relatively fixed proportions. For high values of σ, the goods are strong substitutes, and people would readily reduce their consumption of one item if the relative price of that good increased.

Given the utility function that is described in Eq. (7), rational decision-making by status-conscious individuals would give rise to the first-order conditions:

$$\alpha_c c_1^{\gamma-1} = \frac{\alpha_s}{c_2} = \frac{\alpha_l}{w} l^{\gamma-1} \tag{9}$$

From these equations, it follows the share of total expenditure allocated to status consumption is:

$$\frac{c_2}{c} = \frac{\alpha_s}{\alpha_s + \alpha_c c_1^{\gamma}} \tag{10}$$

According to Eq. (9), the level of pure consumption (c_1) is an increasing function of w.[4] Hence, Eq. (9) implies that the share of total expenditures allocated to status consumption increases with the level of labor productivity (w) if, and only if, $\gamma < 0$. For $\gamma > 0$, the ratio c_2/c in fact decreases with the level of total consumption.

To rephrase these results in terms of the elasticity of substitution between pure consumption and social status, we observe that if consumption and status are good substitutes (i.e., if $\sigma > 1$), positional goods attract a declining share of expenditure as labor productivity rises. If one interprets labor productivity as an index of overall affluence, this finding contradicts Hirsch's reasoning concerning the links between status-seeking and economic growth Hirsch (1976). In this case, social status becomes increasingly costly as people become more wealthy so that rational individuals substitute away from it. On the other hand, if the two goods are poor substitutes (i.e., if $\sigma < 1$), the Hirsch intuition remains valid. When $\sigma < 1$, it follows that the share of material goods devoted to status competition increases with w.[5]

As in the preceding section, the consumption of status goods is wasteful when viewed from a broad social perspective. Since the social status of the average person is fixed, reallocating resources from the consumption of c_2 to support increased leisure and/or pure consumption (i.e., c_1) would enhance social welfare. Viewed in proportion to total expenditure, however, it is not necessarily true that the social waste caused by status-seeking is exacerbated by the process of economic growth. Under certain assumptions, relative status-seeking declines in importance as real incomes rise. Still, the consumption of status goods in absolute terms increases with affluence.

4. Alternative status functions

Since social status is a complex concept, our simplified model cannot capture all aspects of status-seeking. In the Oxford Advanced Learner's Dictionary, the word 'status' is defined as a person's 'social, legal or professional position or rank in relation to others' (Hornby, 1989). Historically, people have attempted to increase their status in a variety of ways—by violence, through education, by spending time to get a suntan, or through expenditures on make-up and fashionable clothes. Our focus on relative consumption is linked to Dittmar's analysis of the social psychology of material possessions Dittmar (1992) and is supported by a variety of empirical evidence (Brekke and Howarth, 2002). Nonetheless, it is interesting to explore the consequences of replacing the relative consumption formulation with other plausible alternatives. As we shall see, the particular specification of the status function has crucial implications for the results of the analysis.

4.1. The additive consumption model: the rat-race

As indicated in Section 2, Stigler and Becker (1977) arrive at results which appear to contradict the conclusions outlined above. The reason is that Stigler and Becker work with a model in which status (or 'social distinction') is determined by an additive function based on a contribution from the individual's social environment (D) plus her own

[4] To see this, note that differentiating Eq. (8) with respect to w yields:

$$\frac{\partial c_2}{\partial w} = (1-\gamma)\frac{\alpha_s}{\alpha_c} c_1^{-\gamma} \frac{\partial c_1}{\partial w} = (1-\gamma)\frac{\alpha_s}{\alpha_l} l^{-\gamma} \frac{\partial l}{\partial w}$$

Under the assumptions of the model, the terms $(1-\gamma)(\alpha_s/\alpha_c)c_1^{-\gamma}$ and $(1-\gamma)(\alpha_s/\alpha_l)l^{-\gamma}$ are unambiguously positive. Hence the derivatives $\partial c_1/\partial w$, $\partial c_2/\partial w$ and $\partial l/\partial w$ must have the same sign. Since an increase in w implies an increase in consumption of at least one of these goods, it follows that the consumption of all three goods (and hence c_1) is increasing in w.

[5] Cole et al. (1992) derive similar conclusions in a model in which social status depends on the relative accumulation of financial capital.

contribution. Although their discussion is mainly verbal, the following specification is a reasonable (though somewhat simplified) representation of their argument.

If one assumes that $D = K - \bar{c}_2$ where K is a strictly positive constant, it follows that:

$$s = D(\bar{c}_2) + c_2 = c_2 - (\bar{c}_2 - K) \tag{11}$$

The intuition is that an individual's social status depends on the algebraic difference between her own consumption of good 2 and the average consumption level in society. Below, we will refer to this status function as 'Case 2.'

We assume that the utility function takes the logarithmic form given by Eq. (5). Replacing Eq. (3) with Eq. (10) while maintaining all other assumptions as above yields the following first-order conditions:

$$\frac{\alpha_c}{c_1} = \frac{\alpha_l}{wl} = \frac{\alpha_s}{c_2 - (\bar{c}_2 - K)} \tag{12}$$

that describe individually rational behavior for the model under consideration. Using the budget and time constraints, and the fact that $c_2 = \bar{c}_2$ in equilibrium, we get the solution reported as Case 2 in Table 1.

With the additive specification of the status function, the equilibrium level of 'pure' consumption (c_1) is independent of labor productivity and thus the affluence of society. Leisure, on the other hand, is a decreasing function of productivity. Increases in w lead to accompanying increases in expenditures on the status good (c_2), but status itself remains fixed at the level $s = K$ since average consumption ($\bar{c}_2$) grows in parallel with c_2.

In the context of this model, the level of utility or welfare decreases with the productivity of society. This version of the model captures the idea that economic growth might be an accelerating rat race for social position that leaves all individuals worse off than they would be at comparatively low income levels. This captures Hirsch's notion that growth may cause people to work harder to obtain more and more status goods that do not produce any benefits from a broad social perspective.

This conclusion is very different from the results derived for Case 1. The reason is that with an additive measure of social status, the marginal implicit price of status does not increase with average consumption. Regardless of the amount of status goods consumed by everyone else, the marginal cost of increasing one's own status is always just one unit of consumption. An additive status function implies, for example, that buying a Rolex watch has the same effect on one's status whether one lives in a small village in rural Nicaragua or on Sunset Boulevard in Hollywood (that is, under the somewhat dubious assumption that preferences are the same in these contexts). This example, at least, seems quite implausible. With a ratio measure of social status, in contrast, the marginal cost of status increases with the average consumption level; the more everybody else consumes, the less I can impress others by consuming a little bit more.

4.2. The relative time use model

The example above demonstrates that the choice between a ratio or additive measure of social status

Table 1
Equilibrium solutions with different status functions and logarithmic utility

Status concept	Case 1 Consumption ratio	Case 2 Additive consumption	Case 3 Time–use ratio	Case 4 Additive time use
s	$s = c_2/\bar{c}_2$	$c_2 - (\bar{c}_2 - K)$	$l_2/\bar{l}_2$	$l_2 - (\bar{l}_2 - K)$
c_1 (or c)	$(\alpha_c/(\alpha_c + \alpha_l + \alpha_s))wT$	$(\alpha_c/\alpha_s)K$	$(\alpha_c/(\alpha_c + \alpha_l + \alpha_s))wT$	$(\alpha_c/\alpha_s)wK$
c_2	$(\alpha_s/(\alpha_c + \alpha_l + \alpha_s))wT$	$wT - (\alpha_c + \alpha_l)/\alpha_s K$	–	–
l_1 (or l)	$(\alpha_l/(\alpha_c + \alpha_l + \alpha_s))T$	$(\alpha_l/\alpha_s w)K$	$(\alpha_l/(\alpha_c + \alpha_l + \alpha_s))T$	$(\alpha_l/\alpha_s)K$
l_2	–	–	$(\alpha_s/(\alpha_c + \alpha_l + \alpha_s))T$	$T - (\alpha_c + \alpha)_l/\alpha_s$
$\partial U/\partial w$	α_c/w	$-\alpha_l/w$	α_c/w	α_c/w

is very important when status is defined in terms of comparative consumption. However, an alternative assumption is that status is not related to consumption goods, but is rather acquired through the use of one's time—for example by spending time in a solarium to get a suntan. As Veblen (1899) argued in his critique of late-19th-century society, refined language and manners are symbols that a person may acquire only through participating in elite forms of leisure. Bourdieu (1984) presents a similar analysis that focused on 20th-century French society. In light of these arguments, our analysis also considers the case where status is defined in terms of comparative leisure.

We assume now that there is just one consumption good (c) but two types of leisure. In this revised model, l_1 is defined as 'true leisure,' while l_2 is time spent on status-related activities that provide no direct utility. The utility function (Eq. (5)) and the budget constraint (Eq. (1)) hold as before, though it is necessary to replace the variables c_1 and l with the alternatives c and l_1. In addition, the time-use constraint (Eq. (2)) must be rewritten in the form:

$$T = l_1 + l_2 + L \tag{13}$$

Finally, we assume now that social status is defined as the ratio between an individual's own 'status leisure' and the average level in society ($\bar{l}_2$). Thus:

$$s = \frac{l_2}{\bar{l}_2} \tag{14}$$

A rational individual would seek to maximize her utility subject to her time-use and budget constraints, taking $\bar{l}_2$ as an exogenous parameter. This problem generates the first-order conditions:

$$\frac{\alpha_c}{c} = \frac{\alpha_l}{wl_1} = \frac{\alpha_s}{wl_2} \tag{15}$$

that characterize consumer behavior in the context of a competitive economy. Since individuals are identical, it follows that $\bar{l}_2 = l_2$ in competitive equilibrium. Solving these equations for the endogenous variables yields the outcome that is labeled 'Case 3' in Table 1.

Just as in Case 1 (in which status is defined using a ratio measure of relative consumption), the consumption level is strictly proportional to the level of labor productivity (w) in this version of our model. In addition, both 'true' leisure (l_1) and 'status' leisure (l_2) are independent of an individual's earning potential. It may appear that status-seeking increases with productivity in Case 1 but not in Case 3, since the absolute amount of consumption goods spent on status-seeking increases with w in Case 1, while the absolute amount of time spent on status-seeking in Case 3 is constant. However, since the value of leisure is determined by w, the value of the resources spent to achieve status is equal in the two cases.

Actually, by substituting the time-use constraint into the budget constraint, we find that the budget constraint may be written in the form $c_1 + wl_1 + wl_2 = wT$. In a similar vein, a typical person's social status may be written as $s = wl_2/w\bar{l}_2$. Replacing wl_2 by c_2, we find that Case 3 is formally equivalent to the utility maximization problem in Case 1. Hence, the solution in this case is equal to the solution in Case 1, despite the fact that social status is reformulated in terms of relative time use.

4.3. The additive time-use model

To conclude our analysis, we consider the implications of defining social status in terms of an additive measure of relative time use. In this scenario, we maintain the assumptions described in the preceding section with one key exception—we model social status using the functional form:

$$s = l_2 - (\bar{l}_2 - K) \tag{16}$$

where, as before, K is a positive parameter. Under this assumption, a rational individual would behave according to the first-order conditions:

$$\frac{\alpha_c}{c} = \frac{\alpha_l}{wl_1} = \frac{\alpha_s}{w(K - \bar{l}_2 + l_2)} \tag{17}$$

The resulting competitive equilibrium is described as 'Case 4' in the summary presented in Table 1.

In this case, it turns out that both l_1 and l_2 are constant and hence independent of labor produc-

tivity (w), while consumption increases in proportion to w. In this sense, the results of this model are broadly similar to those that arise when social status is defined using a ratio measure of either relative consumption (Case 2) or relative time use (Case 3).

To facilitate comparisons between all four versions of the model, Table 1 calculates the impact of a marginal increase in labor productivity on the utility experienced by a typical member of society in competitive equilibrium. In Cases 1, 3 and 4, this indicator of marginal utility takes on the positive value $\partial U/\partial w = \alpha_c/w$ that depends on the weight that people attach to the enjoyment of pure consumption.

It is only in the rat race model (Case 2) that productivity growth leads to diminished utility or welfare so that $\partial U/\partial w$ takes on the negative value $-\alpha_l/w$. This outcome depends crucially on the assumption that status is achieved through an additive measure of comparative consumption. The intuitive explanation of the difference between Case 2 (additive consumption) and Case 4 (additive time use) is that the relative price effect is dissimilar. In the latter case, status is linked to time use, and time becomes increasingly valuable as productivity grows. In Case 2, in contrast, status is linked to consumption, which becomes increasingly cheap as productivity grows.

5. Conclusion

The notion that status-seeking leads to excess levels of consumption at the cost of resource depletion and environmental degradation is a familiar theme in ecological economics. In line with this view, Hirsch (1976) argued that the share of income devoted to the purchase of status goods should rise in the face of economic growth. The analysis presented in this paper suggests that Hirsch's hypothesis holds true only under particular assumptions regarding the structure of individual preferences, even if the marginal utility of consumption is decreasing and the supply of status is fixed.

A strong form of Hirsch's argument is presented in the rat race model of Section 4.1. In this model, social status is defined in terms of the algebraic difference between an individual's own consumption and the average consumption of status-related goods. Given a logarithmic utility function, an exogenous improvement in labor productivity yields a new equilibrium with less leisure, more status-seeking, and lower human welfare. In this case, scarce social resources are devoted to the pursuit of increased economic output despite the fact that all members of society would be better off if time at work were reallocated to leisure. This result echoes the concern of Hirsch (1976) and Daly (1977) that the social costs of economic growth may exceed the human benefits under certain economic conditions.

If, however, social status is defined in terms of the ratio of individual consumption and the average consumption of status goods, then productivity growth will augment the share of total resources spent on status-seeking only in the case where social status and consumption are poor substitutes. When pure consumption and status are good substitutes, the relative importance of status-seeking decreases with prosperity. Without imposing specific assumptions about the form of the utility function, this version of the model provides no a priori reason to expect relatively less status-seeking in poor societies than in richer ones. In particular, with logarithmic utility, there is no relationship at all between average consumption levels and the relative share of total expenditure spent on positional goods. Nor is it the case that an increasing part of the utility derived from consumption comes from positional goods. If status is modeled as relative time spent on status-related activities, rather than relative consumption, we get roughly similar results.

Although our analysis does not explicitly examine the ties between material consumption and environmental degradation, we believe that our findings are of direct relevance to key issues in ecological economics. To understand the implications of status-seeking for environmental quality, one must carry out careful analytical and empirical research to test the hypotheses generated by intuitive reasoning. While intuition suggests that the economic consequences of status-seeking might be relatively transparent, the analysis pre-

sented in this paper suggests a more complex set of possibilities. There is ample room for further study of this constellation of issues.

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