CAN STATUS SEEKING BEHAVIOUR BE GOOD FOR THE ENVIRONMENT?

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Abstract

Striving to improve social position via consumption generate resources exhaustion, as not all of us can enhance our social position. Status concern behaviour ought thus to be likely harmful to the environment. Nevertheless, numerous investigations show that status concern and growth are linked, and several investigations categorized as Environmental Kuznets curves, show that growth in fact ameliorates the environment. If status concern boosts growth it even may, in the long run, ameliorates the environment. How does status seeking behaviour influence the environment? We examine this question using an overlapping generations model including status and environmental externalities. It is shown that striving for status has both negative and positive impacts on environmental quality. Whether the positive impact dominates the negative one depends on the degrees of status seeking, environmental externalities and the size of the economy.

Keywords: status, overlapping generations, environmental quality

JEL Classification: D62, D91, E21

1. INTRODUCTION

Status concern is an essential fact of life. Veblen (1899) highlights the occurrence of the status desire, which he defines as “the stimulus of an invidious comparison which prompts us to outdo those with whom we are in the habit of classing ourselves.” (p. 63). Status (some authors have referred to it as envy, or aspiration, or positional externalities, or keeping up with the Joneses (Pollack,1976; Frank, 1985, 1990, 2007)) has been widely used in recent studies of environmental economics. Ng and Wang (1993) indicate that the social status seeking causes extremely high levels of consumption which engender environmental damages. Howarth (1996) examines the consequences of a status race for the design of efficiency-inducing policies for the environment. Howarth (2000, 2006) points out that economists tend to overestimate the optimal level of emissions of greenhouse gases, as they disregard the role of interdependence of preferences in consumption. He concludes that social welfare should not count pleasures obtained from status, and thus the optimal taxes on carbon dioxide emissions should be higher. Brekke and Howarth (2002) indicate that relative status may lead individuals to largely underestimate non-market environmental services and the full social benefits of public goods. Carrying on the literature on the environmental Kuznets curve, they introduce status concerns and reveal that consumption interdependence intensifies the rate of environmental damaging. In a framework of car purchase, Johansson-Stenman and Martinsson (2006) states that the status impact is not easy to sort out using consumption data for goods and accordingly it is not always apparent how significant status is when making consumption decisions. Biel and Thogersen (2007) evaluate motives for giving to environmental compliance, such as social norms that support cooperation behaviour. The presence of other-regarding preferences is important in the perspective of agent emission decrease via more rigorous climate policy in areas like transport, energy and consumption. The rationale is that other-regarding preferences, like social norms, intrinsic motivation, and altruism, can generate voluntary environmentally responsible behaviour. Long and Wang (2009) investigate renewable resource extraction by a finite number of status-conscious individuals that interact strategically. They conclude that status consciousness decreases the economy's growth rate. Goerke and Hellesheim (2013) concludes that agents under certain conditions supply more labour if they are concerned with their status than they would in an undistorted economy without relative concerns. Bouché and de Miguel (2019) explore the repercussions of assuming that the intensity of aspirations is endogenous. They show that such a change in the intensity of aspirations induce a U-shaped relationship between capital accumulation and environmental quality. The frame of reference considered in this framework is the average consumption of society: individuals derive utility not only from their absolute consumption levels and from environmental quality, but also from the status attained by consuming at above-average levels. Status affects consumption decisions. Since consumption generates a negative environmental externality, status desire also have an (adverse) impact on the environment. In the context of an overlapping generations (OLG) economy, this paper explores the impact of status concern on the state of the environment using an increasing absolute risk aversion (IARA) utility function. It is shown that status concern has both negative and positive consequences on environmental standards.

This paper is organized as follows. Section 2 introduces the model. Section 3 considers the competitive equilibrium, whereas in Section 4 we show the main results. Section 5 is devoted to the conclusions.

2. THE MODEL

We assume an overlapping generation economy of N_t identical agents. Each agent lives for two periods, young and old age, and works only during the first period. The size of the population is constant and normalized to one. Each generation is endowed with w units of a private good in first period and with nothing in second period of life. Each generation can access a storage technology with a gross return rate of $R > 0$. If a generation invests one unit of a private good in first period, then it can gain R units in second period. The individuals' constraints over the two periods can therefore be summarized as follows:

$$w_t = c_t^1 + s_t + m_t \tag{1}$$

$$c_{t+1}^2 = Rs_t \tag{2}$$

These constraints are summarized as the life-cycle budget constraint:

$$c_t^1 + c_{t+1}^2/R + m_t = w_t \tag{3}$$

As in John and Pecchenino (1994), the evolution of environmental quality is given by

$$Q_{t+1} = Q_t - \beta\left(\sum_{i=1}^{N}(c_t^1)^i + \sum_{j=1}^{N}(c_t^2)^j\right) + \delta\sum_{i=1}^{N}(m_t)^i \tag{4}$$

The superscripts i and j represent respectively a single individual from young and old generations. Q_t is the environment quality in period t, Q_{t+1} is the environment quality in period $t+1$, $\beta > 0$ stands for the degradation of the environment and $\delta \rangle 0$ is the environmental improvement due to the actions of the young at t.

We introduce status desire following the work of Wendner (2005). The variable $\tilde{c}_t^1$ defines effective consumption of a single individual in the first period of life:

$$\tilde{c}_t^1 \equiv c_t^1 - \sigma C_t \tag{5}$$

The parameter $\sigma \in [0,2]$ expresses the desire of households for status. The higher σ is, the younger individuals care for status and for the consumption level of their peers. This formulation of status is equal to the keeping up with the Joneses formulation utilized in Ljungqvist and Uhlig (2000). C_t is the average consumption across all individuals such that,

$$C_t \equiv \left(\sum\nolimits_i (c_t^1)^i + \sum\nolimits_j (c_t^2)^j\right)/(N_t + N_{t-1}) \tag{6}$$
$$= \left(\sum\nolimits_i (c_t^1)^i + \sum\nolimits_j (c_t^2)^j\right)/2N$$

In aggregate, if all individuals behave the same way,

$$C_t \equiv (N_t c_t^1 + N_{t-1} c_t^2)/(N_t + N_{t-1}) = (c_t^1 + c_t^2)/2 \tag{7}$$

Individuals take C_t as given. Each person's status rises with his own consumption but reduces with the average consumption of society.

Variable $\tilde{c}_{t+1}^2$ denotes effective consumption of an individual born in t in the second period of life:

$$\tilde{c}_{t+1}^2 \equiv c_{t+1}^2 - \sigma C_{t+1} \tag{8}$$

Substituting equation (7) into (5) gives

$$\tilde{c}_t^1 = \frac{(2-\sigma)c_t^1 - \sigma c_t^2}{2} \tag{9}$$

Similarly, substituting equation (8) into (9) gives

$$\tilde{c}_{t+1}^2 = \frac{(2-\sigma)c_{t+1}^2 - \sigma c_{t+1}^1}{2} \tag{10}$$

Then, the lifetime utility of an agent in generation t is

$$Z_t = \tilde{c}_t^1 - \alpha(\tilde{c}_t^1)^2 + \tilde{c}_{t+1}^2 - \alpha(\tilde{c}_{t+1}^2)^2 + Q_{t+1} - \alpha(Q_{t+1})^2 \tag{11}$$

where the coefficient $\alpha > 0$ represents the magnitude of elasticity of marginal utility with respect to consumption or environmental quality.

3. COMPETITIVE EQUILIBRIUM

The household chooses $\{c_t^1, c_{t+1}^2, s_t, m_t\}$ to maximize his utility (11) subject to (3) and (4). The first-order conditions which express the outcome of generation t are

$$(1 - 0.5\sigma/N)(1 - 2\alpha\tilde{c}_t^1) = (\delta + \beta)(1 - 2\alpha Q_{t+1}) \tag{12}$$

$$(1 - 0.5\sigma/N)R_{t+1}(1 - 2\alpha\tilde{c}_{t+1}^2) = \delta(1 - 2\alpha Q_{t+1}) \tag{13}$$

A steady state equilibrium is an allocation such that $\{c^1, c^2, m, Q\}$ is stationary along the equilibrium path. Particularly, the steady state equilibrium levels of consumption and environmental quality $\{c^1, c^2, Q\}$ are represented by the following three equations:

$$(1-0.5\sigma/N)\{1-2\alpha[(1-0.5\sigma)c^1-0.5\sigma c^2]\} = (\delta+\beta)(1-2\alpha Q) \tag{14}$$

$$(1-0.5\sigma/N)R\{1-2\alpha[-0.5\sigma c^1+(1-0.5\sigma)c^2]\} = \delta(1-2\alpha Q) \tag{15}$$

$$\beta N(c^1+c^2) = \delta N\left(w-c^1-\frac{c^2}{R}\right) \tag{16}$$

Equations (14), (15) and (16) lead to the existence and uniqueness of the steady state equilibrium.

4. THE IMPACT OF STATUS CONCERN ON ENVIRONMENTAL QUALITY

This section studies how status desire influences the steady state equilibrium level of environmental quality, afterward discusses the consequences of the result for an economy under status concern.

The differentiation of (14), (15) and (16) with respect to c^1, c^2, Q and σ taking β, δ and R as given yields

$$\begin{bmatrix} -2\alpha(1-0.5\sigma/N)(1-0.5\sigma) & \alpha\sigma(1-0.5\sigma/N) & 2\alpha(\delta+\beta) \\ \alpha\sigma(1-0.5\sigma/N)R & -2\alpha(1-0.5\sigma/N)(1-0.5\sigma)R & 2\alpha\delta \\ N(\delta+\beta) & N\left(\frac{\delta}{R}+\beta\right) & 0 \end{bmatrix}\begin{bmatrix}\partial c^1 \\ \partial c^2 \\ \partial Q\end{bmatrix}$$
$$= \begin{bmatrix} 0.5(1-2\alpha\tilde{c}^1)/N-\alpha(1-0.5\sigma/N)(c^1+c^2) \\ R[0.5(1-2\alpha\tilde{c}^2)/N-\alpha(1-0.5\sigma/N)(c^1+c^2)] \\ 0 \end{bmatrix}\partial\sigma$$

It is directly shown that the determinant of the left-hand side matrix is positive. Let $|\Delta|$ represent the determinant. By Cramer's rule,

$$\frac{\partial Q}{\partial\sigma} = \frac{\alpha N(1-2\alpha Q)}{|\Delta|}\left[\frac{-2\alpha\delta N(1-0.5\sigma/N)(2\beta+\delta+\delta/R)(c^1+c^2)}{(1-2\alpha\tilde{c}^2)}+\delta a + R(\delta+\beta)b\right]$$

where

$$a = (1-0.5\sigma)\left(\frac{\delta}{R}+\beta\right)+0.5\sigma(\delta+\beta)$$

and

$$b = (1-0.5\sigma)(\delta+\beta)+0.5\sigma\left(\frac{\delta}{R}+\beta\right)$$

Proposition: *status concern enhances (deteriorates) environmental quality if and only if* $\alpha(1-2\alpha\tilde{c}^2) \lesseqgtr \Omega(\sigma)$ where

$$\Omega(\sigma) = \frac{\delta a + R(\delta+\beta)b}{2\delta L(1-0.5\sigma/N)(2\beta+\delta+\delta/R)(c^1+c^2)}$$

Consequently, we get $\partial Q/\partial\sigma \gtreqless 0 \Leftrightarrow \alpha(1-2\alpha\tilde{c}^2) \lesseqgtr \Omega(\sigma) \;\; \forall\sigma \geq 0$.

The relation between α and $\Psi(\sigma)$ is shown in Fig. 1. The function $\Omega(\sigma)$ has the following properties. It is strictly decreasing and strictly convex in σ with $\lim_{\sigma\to 0}\Omega(\sigma) = \delta\left(\frac{\delta}{R}+\beta\right) + (\delta+\beta)^2 R/4C(2\beta+\delta+\delta/R)\delta N$ and $\lim_{\sigma\to\propto}\Omega(\sigma) = 0$. If $\alpha(1-2\alpha\tilde{c}^2) \geq \delta\left(\frac{\delta}{R}+\beta\right) + (\delta+\beta)^2 R/4C(2\beta+\delta+\delta/R)\delta N$, therefore $\partial Q/\partial\sigma < 0 \; \forall\sigma \geq 0$; i.e., status concern is always destructive to the environment. However, if $\alpha(1-2\alpha\tilde{c}^2) < \delta\left(\frac{\delta}{R}+\beta\right) + (\delta+\beta)^2 R/4C(2\beta+\delta+\delta/R)\delta N$, the influence of status concern on the environment is determined by taking into consideration the initial value of σ. Given α, there exists a critical level of σ, $\bar{\sigma}(\alpha)|$ $\partial Q/\partial\sigma \gtreqless 0 \Leftrightarrow \sigma \gtreqless \bar{\sigma}(\alpha)$.

For $\alpha(1-2\alpha\tilde{c}^2) \geq \delta\left(\frac{\delta}{R}+\beta\right) + (\delta+\beta)^2 R/4C(2\beta+\delta+\delta/R)\delta N$, status concern is always destructive to the environment. This inequality necessitates large β, δ and N, given C and α.

For $\alpha(1-2\alpha\tilde{c}^2) < \delta\left(\frac{\delta}{R}+\beta\right) + (\delta+\beta)^2 R/4C(2\beta+\delta+\delta/R)\delta N$, the determination of the effect depends on the initial intensity of status concern. By using the condition $\alpha(1-2\alpha\tilde{c}^2) \lesseqgtr \Omega(\sigma)$, which is rewritten as $\alpha(1-2\alpha\tilde{c}^2) \gtreqless \bar{\sigma}(\alpha)$ where $\bar{\sigma}(\alpha)$ satisfies $\alpha(1-2\alpha\tilde{c}^2) = \Omega(\sigma)$, we can evaluate the impact. When the initial value of σ is lower than the critical level $\bar{\sigma}(\alpha)$, a marginal augmentation in σ has a deep impact on the environment; as a result, a greater strength of status concern causes lower environmental standards. Conversely, when the initial value of σ is beyond the critical level, a marginal augmentation in σ has a trivial impact on the environment; therefore, a greater strength of status concern generates better environmental quality.

The result indicates that for $\alpha(1-2\alpha\tilde{c}^2) < \delta\left(\frac{\delta}{R}+\beta\right) + (\delta+\beta)^2 R/4C(2\beta+\delta+\delta/R)\delta N$, there is one more critical level of the intensity of status concern, $\bar{\bar{\sigma}}(\varepsilon)\big(> \bar{\sigma}(\varepsilon)\big)$, such that $Q|_{\sigma=0} \gtreqless Q|_{\sigma>0}$ holds if and only if $\sigma \lesseqgtr \bar{\bar{\sigma}}(\alpha)$(see Fig. 2). Thus, if the initial intensity of status concern σ is larger (less) than the critical level $\bar{\bar{\sigma}}(\alpha)$, then the environmental quality without status concern, $Q|_{\sigma=0}$, is less (larger) than the environmental quality under the presence of status concern, $Q|_{\sigma>0}$. For a larger (smaller) intensity of status concern, the economy undergoes a better (worse) environmental quality relative to the economy without status concern. Therefore, status seeking behaviour is not inevitably destructive to the environment. A higher degree of status concern may be beneficial from environmental protection angle.

5. CONCLUSION

Economists have frequently argued that individuals increase their first and second consumption possibilities in the pursuit of improved status which lead to overconsumption and thus the overuse of the environment. We find that this is not a valid argument. We conclude that the intensity of status concern, the environmental externalities and the size of the economy determine whether status concern is destructive to the environment.

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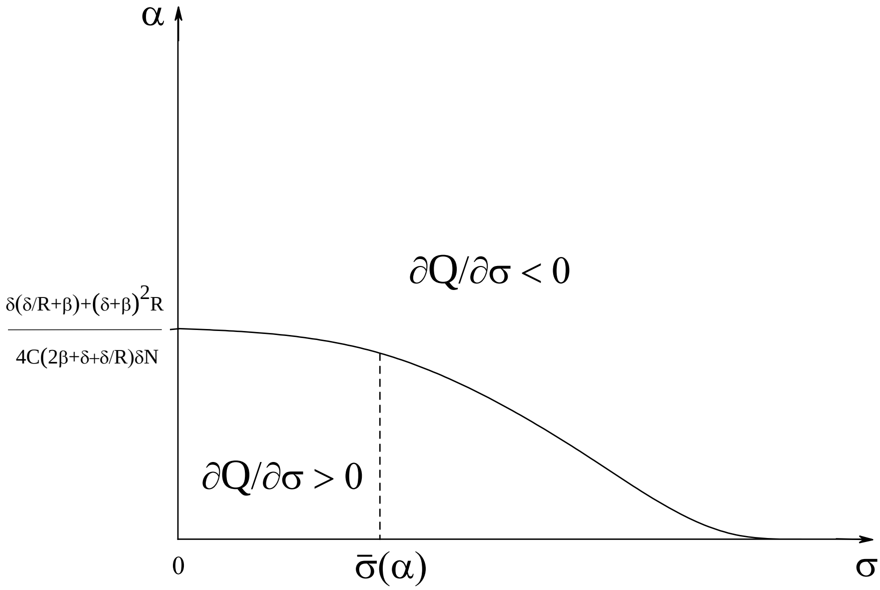

Figure 1

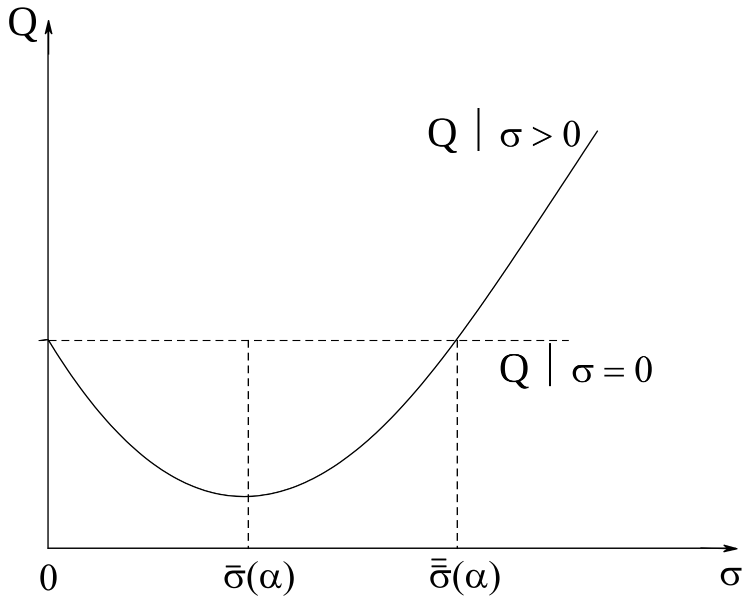

Figure 2