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In the case where social status is defined in terms of the relative accumulation of manufactured capital, status seeking leads to excessive rates of short-run growth and inefficiently high levels of capital and consumption in the long-run equilibrium. Similar results hold when preferences embody a concern for career status as captured by the relative accumulation of human capital, and when relative consumption effects are accompanied by a labor-leisure tradeoff.

Keywords: Growth, Status preferences, relative consumption, relative capital.

JEL classification: 040

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Abstract

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In a Ramsey growth model in which preferences are altered to include a concern for relative consumption, status seeking has no impacts on the economys long-run equilibrium in the absence of a labor-leisure tradeoff. Relative consumption effects do, however, induce short-term departures from efficient resource allocation, either augmenting or depressing consumption growth rates in accordance with the elasticity of substitution between consumption and status.

In the case where social status is defined in terms of the relative accumulation of manufactured capital, status seeking leads to excessive rates of short-run growth and inefficiently high levels of capital and consumption in the long-run equilibrium. Similar results hold when preferences embody a concern for career status as captured by the relative accumulation of human capital, and when relative consumption effects are accompanied by a labor-leisure tradeoff.

1 Introduction

The theory of economic growth has undergone profound changes since the publication of Romer's (1986) well-known article on learning-by-doing. Growth theory originated in the work of Solow (1956) and Swan (1956), who combined neoclassical production theory with time-series data on consumption and investment to construct a stylized model of aggregate economic trends. In the 1960s, the Solow-Swan framework was elaborated through appeals to Ramsey's (1928) infinitely-lived agent and the supporting methods of dynamic optimization. In subsequent years, the resulting model has found extensive applications to problems ranging from macroeconomic stabilization to natural resource scarcity.

The new growth theory constitutes a departure from the received tradition in at least two fundamental respects. First, while the Solow-Swan model took productivity improvements to be an unexplained (but dominant) factor behind the expansion of real income, the emerging literature reconceptualizes technological change as an endogenous process driven by learning-by-doing, research and development, and investments in human capital (Barro and Sala-i-Martin, 1995). Second, the new theory holds out hope that technological progress will offset the law of diminishing returns so that unbounded growth may be achieved in the long run. In this sense, enthusiasm for growth is once again on the rise following the pessimism surrounding the weak economic performance of the 1970s and early 1980s.

Although much of the literature tacitly interprets unbounded growth as a fundamental social good, the normative implications of the new growth theory remain largely unexplored. In political terms, growth is valued for its roles in meeting basic needs, averting distributional conflicts by augmenting the opportunities available to all social groups, and

forestalling the social costs of unemployment and economic dislocation. None of these factors is primarily focused on the direct benefits of consumption. Indeed, criticisms of growth as a measure of progress date back to classical political economy.

John Stuart Mill (1848), for example, challenged the growth enthusiasts of his day for elevating an instrumental good to the status of a pure objective. Although Mill viewed economic growth as necessary to relieve material scarcity and the social inequalities that prevailed in the 19th century, he argued that growth was based on a competitive struggle that stood in conflict with moral and community ideals. In the long run, Mill reasoned, progressive societies would converge to stationary states in which the quest for material gain was displaced by the pursuit of higher ends.

More recently, Hirsch (1976) argued that economic growth is fueled by conflicts over *positional goods,* items that exist in fixed relative supply that mark one's comparative social standing. Attempts to establish status through high relative consumption, for example, dissipate scarce resources in a "positional arms race" (Frank and Cook, 1995) that follows the incentive structure of the prisoners' dilemma. Frank (1985) provides an in-depth defense of the view social status is a basic factor behind economic decisions. Biological studies, Frank notes, establish that status seeking is a pervasive trait of primate behavior, while ethnographic and psychological research suggests that social status is an irreducible feature of human motivation. Apart from such evidence, Postlewaite (1998) argues that social status may provide important instrumental benefits even if it does not directly affect preferences.

The importance of status is also borne out by Easterlin's (1974, 1996) work on the links between income and happiness in social surveys. Although cross-sectional data point to a positive correlation between individual income and self-reported happiness at particular points in time, time-series data establish that average happiness shows no tendency to rise

with average income in nations with sufficient resources to satisfy basic needs. Based on this evidence Easterlin concludes that comparative economic standing, and not absolute levels of income or consumption, is the primary determinant of economic welfare. Oswald (1997) elaborates this argument to account for data on suicide rates and job satisfaction.

The purpose of this paper is to consider the normative implications of incorporating status preferences into stylized models of economic growth. Our goal is to evaluate the intuitive claim that status seeking, if present, would generate excessive growth in consumption and investment. We build on the work of Rauscher (1997), who examines the impacts of relative consumption effects in a one-sector growth model; Corneo and Jeanne (1997), who interpret social status in terms of relative capital wealth; and Fershtman et al. (1996), for whom relative standing is established through educational attainment or the accumulation of human capital.

Each of these specifications finds important support in the received literature. Veblen (1899), for example, focused on the role of conspicuous consumption in signalling social status. Weber (1930), in contrast, claimed that the ethos of capitalism grew out of a religious tradition that downplayed consumption but viewed the accumulation of wealth as a sign that individuals had found favor with God. And in contemporary economics, Frank (1985) emphasizes the role of human capital in establishing social rank through enhanced professional standing.

As we shall see, the implications of status preferences for long-term growth depend critically on the model specification. Status-seeking may either augment or impede the process of economic expansion, though it typically drives a wedge between the perceived private and social benefits of consumption and investment so that competitive equilibria misallocate resources in the absence of corrective policies. To establish these points, we first consider a simple static model in which no capital accumulation takes place. We

then turn our attention to the role of social status in a suite of suitably specified growth models, in which concerns for relative consumption, relative wealth, and relative career attainment may be cleanly differentiated. The paper concludes with a summary of our main findings and a discussion of their implications for the on-going growth debate.

2 Status in a static model

To fix ideas, we commence our analysis by considering a static, competitive economy in which the preferences of a representative individual are defined over consumption (c), social status (s), and leisure (l) according to the utility function $u(c, s, l)$ that is concave and increasing in each of its arguments. Each individual is endowed with one unit of time that is divided between labor (L) and leisure so that $L = 1 - l$. She earns the wage rate w and receives the lump-sum payment π that represents her share of profits earned in the production sector. Based on these assumptions, her budget constraint takes the form:

$$c = w(1 - l) + \pi. \tag{1}$$

Suppose that social status is defined by relative consumption so that:

$$s = c/\bar{c} \tag{2}$$

where $\bar{c}$ is the average consumption level in society. Since individuals are by assumption identical, it follows that $\bar{c} = c$ in equilibrium. Under competitive conditions, however, individuals take wages, profits, and average consumption as beyond the scope of their personal control, seeking to maximize utility through the choice of leisure and consumption. This problem yields the first-order condition:

$$w\left(\frac{\partial u}{\partial c} + \frac{1}{\bar{c}}\frac{\partial u}{\partial s}\right) = \frac{\partial u}{\partial l} \tag{3}$$

that equates the perceived benefits and costs of labor effort from the individual's point of view.

Production activities are managed by competitive firms that seek to maximize the profit level:

$$\pi = f(L) - wL \tag{4}$$

where $f(L)$ is a concave production function that is increasing in labor inputs. It is natural to assume that profits reflect payments to fixed factors such as capital and land. In this sense, we need not assume that outputs are produced using labor inputs alone. Profit maximization implies that labor is paid its marginal product so that:

$$w = f'(L). \tag{5}$$

By standard arguments, the conditions of utility and profit maximization are sufficient to define a competitive equilibrium for this economy. With this in mind, we turn our attention to the structural characteristics of this equilibrium. For means of comparison, consider the problem confronting a benevolent social planner who sought to maximize the utility of a representative person subject to the technical constraints of the model. Although individuals take average consumption as a fixed parameter, the planner would view $\bar{c}$ as an endogenously determined social variable. In a world of identical individuals $\bar{c} = c$ so that social status is fixed at $s(1)$. In this setting, the first-order condition for the planning optimum is:

$$f' \cdot \frac{\partial u}{\partial c} = \frac{\partial u}{\partial l}. \tag{6}$$

that equates the marginal benefits and costs of labor activity from a social perspective.

The competitive equilibrium, in contrast, is characterized by the condition:

$$f' \cdot \left(\frac{\partial u}{\partial c} + \frac{1}{c} \frac{\partial u}{\partial s} \right) = \frac{\partial u}{\partial l}. \tag{7}$$

On the left-hand side of this equation the marginal product of labor is multiplied by the marginal utility of consumption as judged from the perspective of individuals, accounting for both direct effects and the role of consumption in attaining social status. Since the marginal utility of status is strictly positive and since status effects play no role in the characterization of efficient outcomes, it follows that individuals have excessive incentives to pursue consumption at the expense of leisure.

To see this, consider the case where the utility and production functions are given by:

$$u(c, s, l) = c^{\alpha} s^{\beta} l^{\gamma} \tag{8}$$

$$f(L) = aL \tag{9}$$

where α, β, γ, and a are all positive constants. Under these assumptions, the optimal levels of leisure and consumption are:

$$c^* = \frac{a\alpha}{\alpha + \gamma} \tag{10}$$

$$l^* = \frac{\gamma}{\alpha + \gamma} \tag{11}$$

while the competitive equlibrium is given by:

$$\hat{c} = \frac{a(\alpha + \beta)}{\alpha + \beta + \gamma}. \tag{12}$$

$$\hat{l} = \frac{\gamma}{\alpha + \beta + \gamma} \tag{13}$$

Since β is positive it follows that $\hat{c}$ exceeds c^* by the factor $(\alpha + \beta)/\alpha$. The competitive equilibrium therefore generates too much consumption and insufficient leisure, and the departure from optimal resource allocation increases in linear proportion to the weight attached to social status in individual preferences.

In the context of a more general model that allows for heterogeneity between individuals, Howarth (1996) considers the conditions under which efficient resource allocations

may be supported as competitive equilibria in the presence of status effects. The basic requirement is a Pigovian tax that internalizes the costs that each person's consumption imposes on all other individuals through reduced social status. In addition, status effects imply that the social benefits of public goods and environmental quality generally exceed the sum of individuals' willingness-to-pay since individuals attach too much weight to changes in their consumption levels.

Before moving on to the next section we briefly consider the results that ensue when social status is redefined in terms of relative labor effort so that $s = L/\bar{L}$. In this formulation working hard provides status, which might capture the assumption that perceived standing is linked to professional achievement in a model that does not explicitly account for the role of human capital formation. Under this assumption, utility maximization by rational individuals yields the first-order condition:

$$w\left(\frac{\partial u}{\partial c} + \frac{1}{w\bar{L}}\frac{\partial u}{\partial s}\right) = \frac{\partial u}{\partial l} \tag{14}$$

while leaving the conditions of profit maximization and social optimality unchanged. Since equation (14) is identical to equation (3) except for the relative weight attached to the marginal utility of status ($1/w\bar{L}$ versus $1/\bar{c}$), the behavior of the model remains substantially unaltered by this change in specification. Note, however, that profits will be positive if the production function is strictly concave so that $\bar{c} > w\bar{L}$. Under this assumption, it follows that the distortions associated with social status are more pronounced when status is defined in terms of relative labor activity than in terms of relative consumption.

3 Status and growth

The results outlined above are useful in illustrating the conceptual issues that arise when status preferences are introduced to a standard model of consumer choice. In this specifi-

cation, a concern for status can lead to a competitive equilibrium with an excess level of consumption. It is clear, however, that static models can provide only partial insights into the impacts of relative consumption effects on long-run economic growth, while they are wholly inadequate to explore the implications of defining social status in terms of investments in manufactured or human capital. With this in mind, we now turn our attention to the implications of status effects in a simplified model of neoclassical growth.

3.1 Consumption externalities

Consider the problem confronting an infinitely-lived agent who seeks to maximize the objective functional:

$$\int_0^\infty u(c,s)e^{-\rho t}dt \tag{15}$$

where $u(\cdot)$ is a concave utility function that is increasing in consumption (c) and status (s) and where $\rho > 0$ is the pure rate of time preference. We assume, as before, that social status is defined in terms of relative consumption so that $s = c/\bar{c}$.

For ease of exposition, we assume that each individual operates a single-person firm that produces an aggregate commodity using the capital stock (k) and a fixed level of labor services. The dynamics of the capital stock are governed by the differential equation:

$$\dot{k} = f(k) - c \tag{16}$$

where $f(\cdot)$ is a concave and increasing production function. It is readily shown that this specification is observationally equivalent to a decentralized economy in which capital and labor are paid their marginal products. In this sense, the model captures the essential elements of a competitive economy.

A rational individual seeks to maximize her life-cycle utility while taking the time

path of average consumption as fixed. The current-value Hamiltonian for this problem is:

$$H = u\left(c, s\right) + \lambda\left(f(k) - c\right) \tag{17}$$

where λ is the shadow price of capital assets. Since $s = c/\bar{c}$, the first-order conditions take the form:

$$\lambda = \frac{\partial u}{\partial c} + \frac{1}{\bar{c}}\frac{\partial u}{\partial s} \tag{18}$$

$$\dot{\lambda} = \rho\lambda - \lambda f'(k). \tag{19}$$

A first result that flows from these equations is the observation that status externalities have no impacts on the long-run behavior of the economy if the production function exhibits diminishing returns to capital according to the Inada conditions $\lim_{k\to 0} f'(k) = \infty$ and $\lim_{k\to\infty} f'(k) = 0$. Under this assumption, the economy converges to a long-run steady state is characterized as a point where the growth rates of capital and consumption are set equal to zero. A constant consumption level implies that the shadow price of capital remains fixed over time so that:

$$f'(k) = \rho. \tag{20}$$

As in the standard Ramsey model, the economy's long-run equilibrium occurs where the marginal productivity of capital is set equal to the pure rate of time preference. This equilibrium is independent of the specification of the utility function so that concerns about relative consumption have no long-run effects (Rauscher, 1997).

To examine the dynamics of the model, it is useful to impose further restrictions on the structure of preferences. Suppose, for example, that the utility function is given by:

$$u(c, s) = \frac{1}{\alpha + \beta} c^{\alpha} s^{\beta} \tag{21}$$

where α and β are parameters such that $\alpha\beta > 0$ and $\alpha + \beta < 1$. The restrictions on the parameters are necessary to ensure that the utility function is concave and increasing. In

this case, consumption growth is described by the equation:

$$\frac{\dot{c}}{c} = \frac{1}{1-\alpha}\left(f'(k) - \rho\right). \tag{22}$$

If the capital stock is initially below its steady-state value then the concavity of the production function implies that $f'(k) - \rho > 0$. Since $1 - \alpha > 0$ the consumption growth rate is necessarily positive. Consumption growth cannot be sustained unless it is supported by capital accumulation and hence increased output. By standard arguments (Barro and Sala-i-Martin, 1995, ch. 2), it therefore follows that the model converges smoothly to its steady state given an arbitrary capital endowment.

Does the presence of status externalities lead to excessive rates of consumption growth and capital accumulation along the equilibrium path? To answer this question, consider the problem faced by a benevolent social planner who managed consumption and investment to maximize the welfare of a typical individual. If the planner recognized the endogenous determination of average consumption, then her decisions would be characterized by the optimality conditions:

$$\lambda = \frac{\partial u}{\partial c} \tag{23}$$

$$\dot{\lambda} = \rho\lambda - \lambda f'(k). \tag{24}$$

In general, these conditions depart from those associated with the competitive equilibrium (equations 18 and 19) since the planner recognizes that the private benefits of status-seeking behavior are exactly offset by associated social costs. For the utility function under consideration, however, it may be shown that these equations reduce to the form given by equation (22) so that the competitive equilibrium is in fact socially efficient.

Suppose, in constrast, that the utility function took the alternative form:

$$u(c, s) = \frac{c^{1-1/\sigma} - 1}{1 - 1/\sigma} + v(s) \tag{25}$$

where σ is the elasticity of intertemporal substitution and $v(\cdot)$ is a concave and increasing function. As Rauscher (1997) shows, the consumption growth rates that arise under this specification are:

$$\frac{\dot{c}}{c} = \frac{c^{1-1/\sigma} + v'(1)}{c^{1-1/\sigma} + \sigma v'(1)} \sigma \left(f'(k) - \rho \right) \tag{26}$$

for a competitive economy and:

$$\frac{\dot{c}}{c} = \sigma \left(f'(k) - \rho \right) \tag{27}$$

for the planning optimum. According to Rauscher, the impacts of status preferences on consumption growth and capital accumulation depend critically on the value assumed by σ. For $\sigma < 1$ equations (26) and (27) imply that the competitive economy grows more rapidly than is socially efficient. For $\sigma > 1$, however, this situation is reversed so that status externalities generate excess current consumption and deficient rates of short-term growth.

To summarize, we have established that augmenting a standard neoclassical growth model to incorporate a concern for relative consumption has no impacts on long-run economic behavior but can generate either increases or decreases in short-term growth. Before moving on to the next section, we note that these conclusions depend importantly on the assumptions of diminishing returns to capital and an exogenous labor supply.

Suppose, for example, that preferences matched the specification given by Rauscher while the production function took the form $f(k) = ak$ where $a > \rho$ is a positive constant. Under these conditions, the existence of a steady state is ruled out since there is no capital stock that obeys the condition $f'(k) = \rho$. Instead, the economy follows a path of sustained growth according to equation (26). Relative to the optimal path that maximizes the utility of a representative person, the competitive path will either over- or underaccumulate capital depending on the elasticity of intertemporal substitution.

Alternatively, consider the case where the utility function embodies a preference for leisure (l) so that $u(c, s, l) = c^{\alpha} s^{\beta} l^{\gamma}$. In this setting, α, β, and γ are positive constants such that $\alpha + \beta + \gamma \leq 1$. If the production function is described by $\dot{k} = k^a L^{1-a} - c$ where $L = 1 - l$ is the supply of labor and a is a constant between zero and one, then the long-run steady state that arises in a competitive economy is described by the equations:

$$l = \frac{\gamma}{(\alpha + \beta)(1 - a) + \gamma} \tag{28}$$

$$k = \left(\frac{a}{\rho}\right)^{\frac{1}{1-a}} (1 - l). \tag{29}$$

Under these conditions, the level of leisure declines monotonically with β, the coefficient that defines the weight individuals attach to social status. Since both labor activity and the long-run capital stock increase as leisure time diminishes, it follows that status effects augment long-run economic growth under this version of the model. In equilibrium, the marginal product of capital is set equal to the pure rate of time preference as in the standard neoclassical model. The marginal product of capital, however, depends on the labor supply which is in turn conditioned by consumer preferences.

3.2 Capital externalities

The model thus far assumes that social status is defined in terms of relative consumption, building on the conceptual framework advanced by Veblen (1899) and Duesenberry (1949). As we argued above, however, it is not altogether obvious that consumption is the sole (or even principal) determinant of comparative economic standing. According to Weber (1930), the protestant ethic disparages consumption while interpreting capital accumulation as a signal of moral righteousness. In this setting, wealth and not consumption becomes the touchstone of self-worth of community esteem. Following Corneo and Jeanne (1997), we examine the implications of this conception for long-run economic

growth by modelling social status in terms of relative capital wealth.

As before, we assume that a representative individual seeks to maximize the discounted value of utility $\int_0^\infty u(c,s)e^{-\rho t}dt$ subject to the resource constraint $\dot{k} = f(k) - c$. In the present context, however, social status is defined as:

$$s = k/\bar{k}$$

where $\bar{k}$ is average capital wealth. The individual takes the time path of $\bar{k}$ as given while managing consumption and investment decisions to optimize her life-cycle utility. This problem generates the first-order condition:

$$-\frac{\partial^2 u/\partial c^2}{\partial u/\partial c}\dot{c} + \rho = f'(k) + \frac{1}{\bar{k}}\frac{\partial u/\partial s}{\partial u/\partial c}. \tag{30}$$

This equation closely resembles Ramsey's rule for optimal growth in the absence of status effects. Individuals equate the marginal rate of intertemporal substitution and the marginal productivity of capital, thereby bringing the subjective and objective returns of investment into agreement. In the present model, however, capital generates both direct benefits in terms of increased consumption and indirect benefits in the form of enhanced economic status. The last term on the right-hand side of equation (30) weights the marginal rate of substitution between social status and consumption by $1/\bar{k}$, which measures the marginal contribution of capital wealth to perceived status.

A steady state may be shown to exist for this economy under appropriate technical assumptions.[1] At the steady state, the consumption growth rate is zero so that:

$$f'(k) = \rho - \frac{1}{\bar{k}}\frac{\partial u/\partial s}{\partial u/\partial c}. \tag{31}$$

[1]Given the structure of this model, the generalized Inada conditions $\lim_{k\to 0}\left[f'(k) + \frac{1}{k}\frac{\partial u(f(k),1)/\partial s}{\partial u(f(k),1)/\partial c}\right] = \infty$ and $\lim_{k\to\infty}\left[f'(k) + \frac{1}{k}\frac{\partial u(f(k),1)/\partial s}{\partial u(f(k),1)/\partial c}\right] = 0$ are sufficient to ensure the existence of steady-steate equilibrium. These conditions are satisfied under standard assumptions about technology and preferences.

Since the utility function is increasing in both status and consumption, the marginal product of capital falls below the pure rate of time preference. And since the steady state depends explicitly on the marginal utility of status, the long-run behavior of the economy is sensitive to status preferences.

To sharpen this point, we focus on the case where the utility and production functions are given by $u(c_t, s_t) = \frac{1}{\alpha+\beta} c_t^{\alpha} s_t^{\beta}$ and $f(k) = k^a$ where $\alpha\beta > 0$, $\alpha + \beta \leq 1$, and $0 < a < 1$. Using the fact that $\bar{k} = k$ along the equilibrium path, the steady-state capital stock may be written:

$$k = \left(\frac{a + \frac{\beta}{\alpha}}{\rho} \right)^{\frac{1}{1-a}}. \tag{32}$$

Since this expression is monotonically increasing in β, the pursuit of enhanced social status leads to increased levels of capital and consumption under this specification.

As before, a benevolent planner would recognize that the status of a typical individual is fixed at $s = k/\bar{k} = 1$ from the perspective of society of a whole. The planning optimum is thus defined by the first-order condition:

$$-\frac{\partial^2 u / \partial c^2}{\partial u / \partial c} \dot{c} + \rho = f'(k) \tag{33}$$

that maximizes the welfare of a representative person given the endogenous determination of $\bar{k}$. At the steady state, the planning optimum equates the pure rate of time preference and the marginal product of capital so that:

$$k = \left(\frac{a}{\rho} \right)^{\frac{1}{1-a}} \tag{34}$$

given the functional forms imposed on the model. It is readily observed that the levels of capital and consumption that arise in competitive equilibrium exceed those associated with the social optimum.

Under the specified utility function, the consumption growth rate is:

$$\frac{\dot{c}}{c} = \frac{1}{1-\alpha} \left(f'(k) + \frac{\beta c}{\alpha k} - \rho \right) \tag{35}$$

along the competitive path and:

$$\frac{\dot{c}}{c} = \frac{1}{1-\alpha}\left(f'(k) - \rho\right) \tag{36}$$

for the command optimum. In each case, standard arguments establish that the growth rates of capital and consumption are each positive when the capital stock is below its steady-state value so that the model exhibits uniform convergence. Since the term $\beta c/\alpha k$ that arises in equation (35) is unambigously positive, it follows that a concern for social status augments the consumption growth rate. In this sense, the model supports the intuition that status-seeking behavior is an engine of growth that comes at the cost of reduced economic efficiency.

3.3 Career externalities

The concept of human capital is an important element of modern growth theory. In narrow terms, this construct captures the stylized fact that worker productivity is positively associated with expenditures on education and health care. In broader terms, the concept has been extended to incorporate the idea that investments in people augment the state of technology through both direct and indirect mechanisms. As Lucas (1988) demonstrated, investments in human capital can play a critical role in offsetting the onset of diminishing returns to manufactured inputs. For this reason, human capital is a central concern of the literature on endogenous growth (Barro and Martin-i-Sala, 1995).

From a microeconomic perspective, investments in human capital may be interpreted as a means of career-building. Most professions, for example, require lengthy (and expensive) courses of academic study and postgraduate training before one is eligible to commence practice. Students undertake such investments in the pursuit of higher incomes, the intrinsic interest of their chosen field, and the prestige that is connected to

professional status. More broadly, this last item is tied to the familiar observation that one's social standing and life opportunities are closely linked to one's occupation. As Frank (1985) argues, career attainment and hence the relative accumulation of human capital are valued in part because they are a primary determinant of perceived status.

To explore the implications of career externalities for long-run economic growth, we maintain the assumption that a typical individual seeks to maximize the objective functional $\int_0^\infty u(c,s)e^{-\rho t}dt$. For the case at hand, however, we expand the production function to include the services rendered by both manufactured and human capital. Investments in human capital (h) are financed using part of current output so that decision makers face the resource constraint:

$$c + \dot{k} + \dot{h} = f(k,h) \tag{37}$$

where $f(\cdot)$ is a strictly concave and increasing function. Career standing, and hence social status, is then defined in terms of the relative accumulation of human capital so that:

$$s = h/\bar{h} \tag{38}$$

where $\bar{h}$ is the level of human capital held by an average member of society.

Under competitive conditions, a representative person takes $\bar{h}$ as given, seeking to optimize her life-cycle utility through her decisions regarding consumption and investments in manufactured and human capital. This problem generates the first-order condition:

$$-\frac{\partial^2 u/\partial c^2}{\partial u/\partial c}\dot{c} + \rho = \frac{\partial f}{\partial k} = \frac{\partial f}{\partial h} + \frac{1}{\bar{h}}\frac{\partial u/\partial s}{\partial u/\partial c}.$$

A benevolent planner, in contrast, would recognize the endogenous determination of $\bar{h}$ and the fixity of social standing. The command optimum is characterized by the condition:

$$-\frac{\partial^2 u/\partial c^2}{\partial u/\partial c}\dot{c} + \rho = \frac{\partial f}{\partial k} = \frac{\partial f}{\partial h} \tag{39}$$

in which the marginal productivity of each form of capital is equated with the marginal rate of intertemporal substitution.

These conditions are precisely analogous to those developed in the preceding section, where social status was defined in terms of the accumulation of produced capital. At the margin, individuals receive benefits from investments in human capital in the form of enhanced status. These benefits, however, are offset by the external costs that status-seeking imposes on other members of society. In this sense, the allocation of resources by competitive markets leads to systematic incentives to overinvest in human capital.

Steady states will exist for this economy if the production function is strictly concave and obeys suitably specified technical restrictions.[2] In considering the implications of status-seeking for the long-run economic growth, it is useful to restrict attention to the case where the utility and production functions are described by:

$$u(c,s) = \frac{1}{\alpha+\beta} c^{\alpha} s^{\beta} \tag{40}$$

$$f(k,h) = k^{a} h^{b} \tag{41}$$

where the parameters follow the restrictions $\alpha\beta > 0$, $\alpha + \beta \leq 1$, $a > 0$, $b > 0$, and $a + b < 1$. In this instance, competitive resource allocation leads to the steady state:

$$k = \left(\frac{a}{\rho} \left(\frac{b}{a} + \frac{\beta}{a\alpha} \right)^{b} \right)^{\frac{1}{1-a-b}} \tag{42}$$

$$h = \left(\frac{a}{\rho} \left(\frac{b}{a} + \frac{\beta}{a\alpha} \right)^{1-a} \right)^{\frac{1}{1-a-b}} \tag{43}$$

$$c = \left(\left(\frac{a}{\rho} \right)^{a+b} \left(\frac{b}{a} + \frac{\beta}{a\alpha} \right)^{b} \right)^{\frac{1}{1-a-b}} \tag{44}$$

[2] The generalized Inada conditions $\lim_{k \to 0} \partial f/\partial k = \infty$, $\lim_{k \to \infty} \partial f/\partial k = 0$, $\lim_{h \to 0} \left[\frac{\partial f}{\partial h} + \frac{1}{h} \frac{\partial u(f(k),h)/\partial s}{\partial u(f(k),h)/\partial c} \right] = \infty$, and $\lim_{h \to \infty} \left[\frac{\partial f}{\partial h} + \frac{1}{h} \frac{\partial u(f(k),h)/\partial s}{\partial u(f(k),h)/\partial c} \right] = 0$, are sufficient if $\lim_{k \to \infty} \frac{1}{k} \frac{\partial u(f(k),1)/\partial s}{\partial u(f(k),1)/\partial c} = 0$.

in which produced capital, human capital, and consumption all increase with the weight that individuals attach to social status (β). Since the the command optimum corresponds to the case where $\beta = 0$, it follows that the competitive economy will generate excessive levels of wealth and consumption as judged by the criterion of economic efficiency.

As one would expect, status-seeking behavior leads to differential impacts on manufactured and human capital under this specification of the model. To see this, note that the share of total wealth $(k + h)$ held as human capital is:

$$\frac{b + \beta/\alpha}{a + b + \beta/\alpha}.$$

This expression is monotonically increasing in β/α, rising from the optimal level $b/(a+b)$ to unity as β/α increases from zero to infinity.

4 Summary and Conclusion

This paper examines the implications of status-seeking behavior for stylized models of competitive equilibrium and economic growth. The role of status preferences in economic decision-making is a long-standing theme in political economy. Veblen (1899), for example, viewed the quest for conspicuous consumption as a fundamental aim of the American middle class, while Weber (1930) claimed that capital accumulation was a sign of moral righteousness and relative social standing. Authors such as Frank (1985) defend the intuitively plausible claim that professional standing or the accumulation of human capital is an essential contributor to social status. In empirical terms, Easterlins (1974, 1996) findings on the links between personal income and self-reported happiness are consistent with the view that status concerns are an important aspect of individual preferences.

Although intuition suggests that a preference for enhanced economic status should generate excess rates of consumption and economic growth, the analysis presented here

suggests a richer and more complex set of results. We began by considering a simple static model in which a preference for high relative consumption induced a bias towards excess consumption and labor effort. Individuals effort to attain enhanced social status imposed externalities that impaired the efficiency of competitive markets. As Howarth (1996) has shown, inefficiencies of this sort may be rectified through a Pigovian tax on consumption goods. Precisely analogous results hold in the case where social status is defined in terms of relative labor effort.

We then turned our attention to the analysis of a Ramsey growth model in which preferences were altered to include a concern for relative consumption, building on the work of Rauscher (1997). When the labor supply is fixed and the production function exhibits diminishing returns to capital, status-seeking behavior has no impacts on the long-run levels of capital and consumption, although it distorts short-term decisions concerning consumption and investment. When the elasticity of substitution between consumption and social status is less than unity, competitive markets generate short-term growth rates that exceed those generated by the command optimum. With high degrees of substitutability, this finding is reversed so that status-seeking results in a bias towards excess current consumption. These results are sensitive to the maintained assumptions concerning technology and preferences. Under constant returns to capital inputs, this model generates endogenous growth paths that over- or underaccumulate capital according to the degree of substitutability between consumption and status. And when preferences are altered to include a labor-leisure tradeoff, then status-seeking leads to unambiguous increases in long-term economic activity.

Finally, we considered a model in which social status was defined in terms of the relative accumulation of manufactured capital, capturing the essential notion behind Webers protestant ethic (see also Corneo and Jeanne, 1997). In this setting, the consumption

growth rate is increasing with respect to the weight attached to social status; the model converges to a long-run steady state with excessive levels of capital and consumption. Precisely analogous results arise in the case where professional achievement, as captured by the relative accumulation of human capital, is the primary determinant of social status.

References

[1] Barro, Robert J. and X. Sala-i-Martin (1995): *Economic growth*. McGraw Hill, New York.

[2] Brekke, Kjell Arne and Richard B. Howarth (1998): The social contingency of wants – implications for growth and the environment. Section for Resource and Environmental Economics, Statistics Norway.

[3] Corneo, Giacomo and Oliver Jeanne (1997): On relative wealth and the optimality of growth. *Economics Letters,* vol. 54, pp. 87-92.

[4] Duesenberry, James S. (1949): *Income, saving and the theory of consumer behavior*. Harvard University Press, Cambridge, Massachusetts.

[5] Easterlin, Richard A. (1974): Does economic growth improve the human lot? In Paul A. David and Melvin W. Reder (eds.), *Nations and households in economic growth*, Academic Press, New York.

[6] Easterlin, Richard A. (1996): *Growth triumphant – the twenty-first century in historical perspective*. University of Michigan Press, Ann Arbor.

[7] Fershtman, Chaim, Kevin M. Murphy and Yoram S.O. Weiss (1996): Social status, education, and growth. *Journal of Political Economy*, vol. 104, 108-132.

[8] Frank, Robert H. (1985): *Choosing the right pond.* Oxford University Press, New York.

[9] Frank, Robert H. and Philip J. Cook (1995): *The winner-take-all society.* Free Press, New York.

[10] Hirsch, Fred (1976): *Social limits to growth.* Harvard University Press, Cambridge, Massachusetts.

[11] Howarth, Richard B. (1996): Status effects and environmental externalities. *Ecological Economics*, vol. 16, pp. 25-34.

[12] Lucas, Robert E. (1988): On the mechanics of development planning. *Journal of Monetary Economics,* vol. 22, pp. 3-42.

[13] Mill, John Stuart (1848): *Principles of political economy.* Little and Brown, Boston.

[14] Oswald, Andrew J. (1997): Happiness and economic performance. *Economic Journal,* vol. 107, pp. 1815-1831.

[15] Postlewaite, Andrew (1998): The social basis of interdependent preferences. *European Economic Review,* vol. 42, pp. 779-800.

[16] Ramsey, Frank (1928): A mathematical theory of saving. *Economic Journal,* vol. 38, pp. 543-559.

[17] Rauscher, Michael (1997): Conspicuous consumption, economic growth, and taxation. *Journal of Economics*, vol. 66, pp. 35-42.

[18] Romer, Paul M. (1986): Increasing returns and long-run growth. *Journal of Political Economy,* vol. 94, pp. 1002-1037.

[19] Solow, Robert M. (1956): A contribution to the theory of economic growth. *Quarterly Journal of Economics*, vol. 70, pp. 65-94.

[20] Swan, Trevor W. (1956): Economic growth and capital accumulation. *Economic Record,* vol. 32, pp. 334-361.

[21] Veblen, Thorstein (1899): *The theory of the leisure class.* MacMillan, New York.

[22] Weber, Max (1930): *The protestant ethic and the spirit of capitalism* (Talcot Weber, translator). Allen and Unwin, London.