Are Status Concerns Harmful for Growth?

by

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1. Introduction

Empirical investigations indicate that economic growth does not significantly contribute to people's well-being in the developed world. Opinion polls reveal that self-reported happiness in the U.S. did not increase in the entire post-war period despite enormous economic growth (e.g. Easterlin, 1974, 1995). Easterlin (1995) found similar patterns for other developed countries as well. For example, subjective well-being (SWB) in Japan did not change between 1958 and 1987 despite a fivefold increase in real per capita GDP during that period. Moreover, SWB is found to be only weakly positively correlated with average real per capita GDP across countries, although strongly correlated with individual income within countries.

In line with other research (e.g. Frank, 1985a, b), I interpret those findings as evidence that people are concerned about their *relative standing* (or status, respectively) within the society they live in despite of the many potential sampling and nonsampling errors opinion polls generally bear[1]. Indeed, *status* is a good which is always in fixed supply, even in a growing economy.

This paper explores the impact of *status concerns* on growth by connecting the politico-economic endogenous growth model of Bertola (1993) with the 'catching-up-with-the-Joneses' hypothesis. Two channels are explored: first, the effect on savings behavior and, second, the effect on voting behavior with respect to distortionary redistribution policy. Voting outcome affects saving incentives, and thus investment-driven growth. Consideration of the

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[1] For a discussion of potential measurement distortions of evidence about SWB, see Holländer (1996). Whereas SWB studies can only provide indirect evidence for status preferences, an experimental study by Beckman et al. (1997) strongly supports the hypothesis that individuals are willing to trade own income in order to improve their relative position.

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politico-economic channel is especially important in light of the empirical evidence cited above, since *desired* growth rates may be affected by status concerns. That is, individuals may be willing to accept slower *growth* of their income in order to improve their status.

Economists have long recognized that status orientation can substantially affect economic behavior, using various assumptions about how social status can be achieved. In his famous pioneering work, Veblen (1922) argues that wealthy individuals consume conspicuous goods and services, thereby signaling their wealth level in order to gain social esteem. In the model of Duesenberry (1949) individuals with relatively low income levels are myopic to some degree as they neglect future considerations as long as their consumption levels are below their basic needs. These basic needs are assumed to be socially determined and to rise with average income or consumption, respectively. As a result, the individual consumption level is an increasing function of *relative income*. In Cole, Mailath and Postlewaite (1992) and Corneo and Jeanne (1997) the *relative wealth* level determines how well an individual fares with respect to the social sector, implying positive effects of these status preferences on investment-driven growth.

As suggested by Veblen (1922), this paper assumes that (relative) consumption spending determines status. Using similar formulations, both stock market phenomena (e.g. Abel, 1990; Campbell and Cochrane, 1995) and time-series features of consumption data (e.g. Carroll and Weil, 1994) have been addressed. Harbaugh (1996) explores how savings are affected by these kind of status concerns when there are exogenous shocks in the average growth rate of the economy. In my model growth is determined by saving decisions and is thus endogenous. Concerning growth effects of savings behavior, Carroll et al. (1997) and Rauscher (1997) come closest to my paper. Whereas in their models individuals are identical, I allow for heterogeneity in factor endowments and, possibly, in preferences.

Moreover, this paper takes a first step in exploring the impact of status concerns on voting over redistribution in the context of growth. Redistribution takes place through taxation of factor income (i.e. an accumulated and a non-accumulated factor). Higher taxation of the return to the accumulated factor (e.g. human or physical capital income) is detrimental to economic growth. Hence, each individual faces a trade-off between lower taxation of the non-accumulated factor (e.g. land or raw labor) and slower growth of income from this factor. The analysis suggests that more status-oriented economies tend to have higher degrees of redistribution, even though the distortionary taxation effects are fully taken into account by voters.

The paper is organized as follows: Section 2 outlines the model. Section 3 derives the equilibrium growth path for given policy variables when agents have status concerns. In section 4 individual policy preferences for factor income taxation and political outcomes are derived. Section 5 discusses how growth effects through the proposed channels are affected by alternative ways to model status concerns. The last section concludes.

2. The Model

2.1. The Aggregate Economy

Technology embodies a source of endogenous growth, as proposed by Romer (1986). There is an accumulated factor K, which has socially non-decreasing marginal returns, and a non-accumulated factor L, which can be viewed as land or unskilled labor. K can be viewed as a composite of human and physical capital[2]. In the case of human capital it is implicitly assumed that the quantity of labor is in fixed supply and the quantity and quality of labor are perfect substitutes, i.e. only the product of the quantity and quality of labor matters for production. For simplicity, the economy's total supply of the fixed factor is normalized to unity. In a closed economy without any market imperfections and without uncertainty, the representative firm produces output Y at time t according to

$$(1) \qquad Y(t) = a\,A(t)\,K(t)^{1-\alpha} L^{\alpha}, \; a>0, \; 0<\alpha<1,$$

where a is a productivity parameter. There is an external productivity of $A(t) = K(t)^{\alpha}$ taken as given by the firm, which is commonly interpreted to be generated by learning-by-doing or human capital spill-over effects[3]. The resulting social production function is thus given by $Y(t) = a\,K(t)$.

Following Bertola (1993), the government can redistribute income by imposing taxes τ_K and τ_L on the respective factor income. The government budget is assumed to be balanced at any point in time[4]. Then at time t after-tax returns $r(t)$ and $w(t)$ on K and L, respectively, are given by

$$(2) \qquad r(t) = r = (1-\tau_K)(1-\alpha)\,a \equiv (1-\gamma)\,a, \; w(t) = (1-\tau_L)\alpha\, a\,K(t) \equiv \gamma\, a\,K(t),$$

[2] This is common in one-sector endogenous growth models (e.g. Rebelo, 1991). However, I would prefer to view the accumulated factor as human capital. The reason is that physical capital is internationally more mobile than human capital, which imposes restrictions on the taxation of physical capital in an open economy.

[3] Despite increasing social returns to scale, this specification allows one to maintain the assumption of perfect competition in the goods market since technology has constant returns to scale for a given level of A. Note that because all firms are identical, one can assume that this level of disembodied productivity depends on the capital stock used by the representative firm.

[4] Since there is no government spending, one factor income is actually subsidized. However, this is not essential for any of the results of this paper. It only matters that there is some kind of trade-off between the taxation of the different factor incomes.

where γ is the after-tax share of the non-accumulated factor in national income[5].

Without depreciation, capital grows over time according to

$$(3) \qquad \dot{K}(t) = a\,K(t) - C(t),$$

where C denotes aggregate consumption and $K(0) = K_0 > 0$ denotes the initial aggregate capital stock. Then balanced growth requires

$$(4) \qquad \vartheta = \hat{K}(t) = \hat{Y}(t) = \hat{C}(t) = \hat{w}(t) = a - C(0)/K_0 \Leftrightarrow C(0) = (a - \vartheta)\,K_0,$$

where the head over a variable denotes its growth rate.

2.2. *Individual Budget Constraints and Preferences*

There is a unit-mass continuum of infinitely living consumers indexed $i \in [0, 1]$, privately owning the production factors (hence, aggregates denote per capita values). They differ in capital endowment $k^i(0) \equiv k_0^i > 0$ (i.e. the individual skill or wealth level) and the endowment of the non-accumulated factor $l^i > 0$. Individual budget constraints are given by

$$(5) \qquad \dot{k}^i(t) \leq r k^i(t) + w(t) l^i - c^i(t), \ \lim_{t \to \infty} e^{-rt} k^i(t) \geq 0,$$

where $c^i(t)$ denotes individual consumption at time t. The latter constraint in (5) is the usual "No Ponzi Game" condition.

Each individual has a time-separable utility function of the type

$$(6) \qquad U^i = \int_0^\infty e^{-\rho t} u^i\left[c^i(t), c^i(t)/C(t)\right] \mathrm{d}t,$$

where ρ denotes the subjective time preference parameter, $0 < \rho < a$. Instantaneous utility may not only be increasing in individual consumption, but also in individual consumption *relative to the per capita consumption level*. Furthermore, instantaneous utility is assumed to be strictly concave in c^i for all C. As commonly assumed in the endogenous growth literature, instantaneous utility has a CRRA form, specified as

$$(7) \qquad u^i(c^i, c^i/C) = \begin{cases} \dfrac{[(c^i)^{1-\beta^i}(c^i/C)^{\beta^i}]^{1-\sigma} - 1}{1-\sigma}, & \sigma > 0, \sigma \neq 1 \\ (1-\beta^i)\ln c^i + \beta^i \ln(c^i/C), & \sigma = 1 \end{cases}$$

[5] Note that under profit maximization, the pre-tax factor returns equal $(1-\alpha)Y/K = (1-\alpha)\,a$ and $\alpha Y/K = \alpha\,a\,K$, respectively. Hence, since the balanced budget assumption requires $\tau_K(1-\alpha)\,a\,K + \tau_L\,\alpha\,a\,K = 0$, both factor taxes have to be chosen proportionally according to $(1-\alpha)\tau_K = -\alpha\,\tau_L$. Defining $\gamma \equiv (1-\tau_L)\,\alpha$ gives equation (2).

where $0 \leq \beta < 1$. If $\beta^i > 0$, what matters for an individual is not only the absolute level of consumption but also being above or below the per capita level of consumption. This captures the idea that individuals care about their social status and is referred to as 'status preferences' throughout the paper. Alternatively, one could imagine that individuals care about their percentile rank in the distribution of consumption spending. However, it seems more plausible to assume that status is also determined by the actual distance of consumption levels between individuals. The parameter σ denotes the degree of relative risk aversion.

3. Equilibrium Growth

In this section, the impact of status preferences (i.e. $\beta^i > 0$ for some i) on the equilibrium growth rate ϑ is examined.

Each individual maximizes utility (6), (7) subject to the budget constraints (5), perfectly foreseeing and taking as given the path of aggregate consumption, i.e. each agent perceives himself/herself as too small to have an impact on aggregate consumption.

As shown in appendix A, each individual i chooses his/her consumption level to grow according to

$$\hat{c}^i(t) = \frac{r - \rho + \beta^i(\sigma - 1)\hat{C}(t)}{\sigma}. \tag{8}$$

(8) states that individual consumption growth increases (decreases) with status preferences if $\sigma > 1$ ($\sigma < 1$). This can be interpreted as follows. Consider the case in which individuals have a high degree of relative risk aversion $\sigma > 1$, i.e. in the benchmark case $\beta^i = 0$ the intertemporal elasticity of substitution of such an individual is low. Because of his/her 'impatience', he/she chooses a low savings rate. Given any aggregate consumption path $C(t)$, this also implies a high relative consumption today at the cost of a low one in the future. However, if $\beta^i > 0$, this is not optimal anymore since a small consumption growth rate implies that the individual cannot 'catch-up-with-the-Joneses' in the future. Thus, all other things being equal, he/she chooses a higher savings rate than someone without status concerns. In contrast, if $\sigma < 1$, status preferences induce the individual to give up relative consumption in the future in order to improve status today. With respect to an equilibrium one can draw the following conclusions:

Proposition 1 (steady state growth): (i) If $\beta^i = \beta$ for all i or $\sigma = 1$, then there exists a unique steady state where the growth rate of the economy

$$(9) \qquad \vartheta = \frac{r-\rho}{\sigma(1-\beta)+\beta}$$

increases, does not react, decreases with status preferences β if $\sigma >, =, < 1$, respectively[6]. (ii) If $\beta^i \neq \beta^j$ for some $i \neq j$ and $\sigma \neq 1$, then a steady state does not exist.

Proof: (i) For $\sigma = 1$ the result directly follows from (8) since $\vartheta = r - \rho$. Now consider the case $\sigma \neq 1$ with $\beta^i = \beta$ for all i. Suppose there is an agent i choosing, say, $\hat{c}^i(t) > \hat{C}(t)$ at any point of time t, which is equivalent to $\hat{C}(t) < \frac{r-\rho}{\sigma(1-\beta)+\beta}$ according to (8). Then there is at least one agent $j \neq i$ choosing $\hat{c}^j(t) < \hat{C}(t)$, which is equivalent to $\hat{C}(t) > \frac{r-\rho}{\sigma(1-\beta)+\beta}$. But since this is a contradiction, $\hat{c}^i(t) = \hat{C}(t)$ for all i and t. Substituting the latter expression in (8) yields the result. (ii) If a steady state exists, then all individuals must choose a common consumption growth rate ϑ. According to (8), this implies $\vartheta = \frac{r-\rho}{\sigma(1-\beta^i)+\beta^i}$. But this expression depends on i. Hence, it cannot represent a steady state. □

Proposition 1 shows that the *direct* effect (i.e. for a given redistribution policy) of status preferences on savings behavior, and thus on growth, is ambiguous. This ambiguity may be explained as follows. On the one hand, status preferences induce individuals to save less due to their desire to catch up with current consumption levels of other people. On the other hand, rational agents know that savings enable them to increase their relative consumption in the future[7]. Stated differently, there is not only a *negative consumption externality* which arises since no individual accounts for the negative effect on the *current* status of all others when increasing the current consumption[8], but also a *positive savings externality* which arises since no individual ac-

[6] Note that there are no transitional dynamics to a steady state growth path assuming the technology in (1).

[7] Proposition 1 is similar to the results in Carroll et al. (1997) and Rauscher (1997) who, however, only consider an equilibrium with *identical* individuals (i.e. $c^i(t) = C(t)$ for all i and t). Carroll et al. (1997) even conclude that relative consumption preferences always encourage growth since they misleadingly do not consider the case $\sigma \leq 1$.

[8] This effect has been stressed in the earlier literature about relative consumption preferences suggesting that these preferences would yield inefficiently low savings (Frank, 1985a,b).

counts for the positive effect on the *future* status of others when lowering savings today.

4. Status Preferences and Redistribution

In this section the impact of status preferences on voting outcome with respect to factor income redistribution and their consequences for growth are considered. Even if utility functions are such that status preferences do not affect savings decisions in equilibrium for given policy variables (i.e. the case $\sigma = 1$), concerns for relative standing certainly alter preferred redistribution policies. Formally, status preferences enter the indirect utility functions and thus affect individually optimal tax rates.

In order to conduct a useful analysis only those cases in which a steady state exists are considered. For simplicity, $\beta^i = \beta$ for all i is assumed also in the case $\sigma = 1$. Substituting the interest rate r from (2) into (9), the steady growth rate of the economy becomes

$$(10) \qquad \vartheta = \frac{(1-\gamma)a - \rho}{\sigma(1-\beta)+\beta}.$$

As can be seen from (10), there is a negative relationship of the labor share γ and the growth rate ϑ since redistribution from capital to labor income unambiguously depresses growth.

To ensure positive initial aggregate consumption $C(0)$ even if labor income is fully taxed (i.e. $\gamma = 0$), according to (4) one has to assume

$$(11) \qquad a > \frac{a-\rho}{\sigma(1-\beta)+\beta} \equiv \vartheta^{\max} \quad \Leftrightarrow \quad \rho > (1-\beta)(1-\sigma)a.$$

Both individual consumption levels and income from the non-accumulated factor are growing at the same rate ϑ. Furthermore, each individual chooses to accumulate capital at rate $\hat{k}^i(t) = \hat{K} = \vartheta$. Hence, using (2) and the budget constraints (5), initial consumption of individual i is given by

$$(12) \qquad c^i(0) = [(1-\gamma)a - \vartheta]\, k_0^i + \gamma a K_0 l^i$$

(note that (11) implies $r = (1-\gamma)a - \vartheta$ thus ensuring both bounded life-time consumption and bounded income of the non-accumulated factor). The first term of (12) is initial capital income minus savings and the second term is initial income of the non-accumulated factor. Hence, optimal consumption expenditure exceeds income of the fixed factor at any point of time (note that $k_0^i > 0$). According to (2) and (10), voting over tax rates determines both the preferred share γ of the fixed factor and the growth rate ϑ. Rewriting

(10) as $\gamma a = a - \rho - \vartheta(\sigma(1-\beta)+\beta)$ and substituting this expression in (12) yields

$$c^i(0) = \{[\rho - \vartheta(1-\beta)(1-\sigma)]k_0^i/K_0 + [a - \rho - \vartheta(\sigma(1-\beta)+\beta)]l^i\}K_0. \tag{13}$$

It will be useful to define the relative factor endowment of individual i

$$\xi^i \equiv \frac{k_0^i / K_0}{l^i} \tag{14}$$

(remember that total supply of the fixed factor is normalized to unity). It can be shown that an agent i faces a trade-off between his/her initial consumption level and subsequent growth if either $\sigma \leq 1$ or if $\sigma > 1$ and $\xi^i < \bar{\xi}^i \equiv [\sigma(1-\beta)+\beta]/[(1-\beta)(\sigma-1)]$. In the latter case, it is easy to see that $\bar{\xi}^i > 1$. Hence, if (and only if) $\sigma > 1$, individuals with a sufficiently large relative factor endowment would choose a higher consumption level at each point in time, if the capital taxed would be lowered. Agents with $\xi^i = 1$ are called "representative" (see Bertola, 1993), since they face the same kind of trade-off as the economy as a whole. This can also be seen from the individually chosen savings rate

$$sav^i = \frac{\vartheta \xi^i}{(1-\gamma)a\xi^i + \gamma a}, \tag{15}$$

which is constant over time and strictly increasing in ξ^i. An individual savings rate coincides with the aggregate propensity to save ϑ/a if and only if this individual is representative.

Social status of agent i is defined by the relative consumption level which is constant over time and given by

$$S^i \equiv \frac{c^i(0)}{C(0)} = l^i \cdot \frac{[\rho - \vartheta(1-\beta)(1-\sigma)]\xi^i + a - \rho - \vartheta[(\sigma(1-\beta)+\beta)]}{a - \vartheta} \tag{16}$$

according to (4) and (13). S^i is strictly decreasing in ϑ (and thus strictly increasing in γ) if and only if $\xi^i < 1$ (those individuals are referred to as 'capital-poor' throughout the paper)[9]. Hence, lowering the tax on the non-accumulated factor and thus depressing the net return to capital allows capital-poor agents to increase their status, since their relative income rises[10]. If an individual is representative, a change in factor income taxation has no impact on his/her status at all.

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[9] Using (16), one finds $(\partial S^i)/(\partial \vartheta) = -[\rho - (1-\beta)(1-\sigma)a](1-\xi^i)l^i/(a-\vartheta)^2$. (11) implies that the term in square brackets is positive.

[10] Relative income of individual i is constant over time and given by $y^i/Y = l^i\,[\xi^i + (1-\xi^i)\gamma]$.

Substituting the optimal path of individual consumption as well as the aggregate consumption path into (6), (7) yields the indirect life-time utility V^i of agent i

(17)

$$V^i = \begin{cases} \dfrac{(l^i K_0^{1-\beta})^{1-\sigma}\left\{\left[\rho - \vartheta(1-\beta)(1-\sigma)\right]\xi^i + a - \rho - \vartheta\left[\sigma(1-\beta)+\beta\right]\right\}^{1-\sigma}}{(1-\sigma)\left[\rho - \vartheta(1-\beta)(1-\sigma)\right](a-\vartheta)^{\beta(1-\sigma)}} \\ \qquad\qquad - \dfrac{1}{\rho(1-\sigma)}, \quad \sigma \neq 1 \\ \dfrac{1}{\rho}\left((1-\beta)\ln K_0 + \ln l^i + \dfrac{(1-\beta)\vartheta}{\rho} + \ln(\rho\xi^i + a - \rho - \vartheta) - \beta\ln(a-\vartheta)\right), \\ \qquad\qquad \sigma = 1, \end{cases}$$

[note that life-time utility is bounded for all i according to (11)]. Now define $\tilde{\vartheta}^i \equiv \arg\max_{\vartheta} V^i$. It can be shown that V^i is strictly concave in ϑ. Hence, since the labor share γ lies between zero and one (that is, both factor tax rates do not exceed 100%) and (human) capital investments are irreversible, the preferred growth rate of individual i is given by $\vartheta^i = \max\{0, \min\{\tilde{\vartheta}^i, \vartheta^{\max}\}\}$ according to the definition of $\tilde{\vartheta}^i$.

4.1. Preferred Growth Rates and Relative Factor Endowments

Proposition 2: For (6), (7) with $\beta^i = \beta$ for all i. (i) If $\xi^i \geq 1$, then $\vartheta^i = \vartheta^{\max}$, i.e. representative and capital-rich agents prefer the maximal feasible growth rate. (ii) If $\xi^i < 1$, then $\vartheta^i < \vartheta^{\max}$ and $\partial\vartheta^i/\partial\xi^i > 0$, i.e. the preferred growth rate of a capital-poor agent increases with the relative factor endowment.

Proof: Appendix B.

Proposition 2 shows that the result of Bertola (1993) still holds, if one allows for status preferences[11]. Intuitively, individuals who are abundant in the fixed production factor relative to the accumulated factor vote for a high tax on their less abundant factor, which is detrimental to economic growth. Since policy

[11] Alesina and Rodrik (1994) also find that a lower relative factor endowment (as defined here) of the decisive voter slows down growth. In their model, a capital tax is used in order to finance productive public goods and services. In contrast to my model, there is only an indirect trade-off between the return to capital and the return to the fixed factor: The capital tax lowers the return to capital and thus growth but raises the *level* of the return to the non-accumulated factor. Persson and Tabellini (1994) show that a more unequal income distribution (generated by a more unequal distribution of talent) leads to higher taxation of human capital in voting equilibrium. Again, this kind of redistribution is detrimental to growth.

preferences turn out to be single-peaked, the result suggests the following implications of the voting equilibrium. If the political outcome is assumed to be realized by an one-man, one-vote decision and the decisive voter is capital-poor relative to the representative agent, lump-sum redistribution of capital yields faster growth (it is a stylized fact that the distribution of capital income is indeed skewed)[12]. This is because less redistribution through capital taxes is demanded where the latter would depress growth. However, if lump-sum redistribution is not feasible, according to proposition 2 growth is *ceteris paribus* slower in economies with a more unequal distribution of capital[13], or, if the fixed factor is concentrated among the politically decisive class[14].

4.2. Preferred Growth Rates and Status Preferences

However, status preferences may differ across countries, which affects redistribution and growth in the following way.

Proposition 3: For (6), (7) with $\beta^i = \beta$ for all i and $\sigma = 1$: If $\xi^i < 1$ and $\vartheta^i > 0$, then $\partial\vartheta^i/\partial\beta > 0$, i.e. the preferred growth rate of a capital-poor agent decreases with the status preference[15].

Proof: Appendix B.

The intuition of proposition 3 lies in the fact that capital-poor agents gain status with higher levels of redistribution[16]. Hence, stronger status preferences

[12] Typically the median voter theorem is applied, but one could also imagine a political bias to the left or the right of the median voter as proposed by Bénabou (1996).

[13] However, it should be noted that some empirical studies (e.g. Perotti, 1996, Sala-i-Martin, 1996) find that redistribution may have positive growth effects. Relaxing the infinite horizon assumption, the analysis of overlapping generations models by Uhlig and Yanagawa (1996) as well as Bertola (1996) shows that taxing capital income more heavily in favor of the non-accumulated factor may indeed yield faster investment-driven growth. The intuition is that this kind of redistribution relieves the tax burden of young agents leaving them with more income out of which to save. Moreover, if capital markets are imperfect, redistribution may enable poorer individuals to overcome borrowing constraints, and thus accumulation of human capital may be encouraged (e.g. Galor and Zeira, 1993, Perotti, 1993, and Bénabou, 1996).

[14] See Persson and Tabellini (1992) for empirical evidence about negative growth effects of high concentration ratios of land ownership in a cross-country study.

[15] The presumption $\vartheta^i > 0$ is made since $\tilde{\vartheta}^i$ decreases without bound as β increases, but investments are assumed to be irreversible. Hence, if β is sufficiently high, the desired growth rate of a capital-poor agent is zero.

[16] This is shown above for all σ fulfilling (11). However, as appendix B reveals, algebraically trying to show proposition 3 for $\sigma \neq 1$ is hopeless because $\tilde{\vartheta}^i$ is only given implicitly in this case. Nevertheless, the analysis reveals that the intuition of proposition 3 (see above) carries over to the case $\sigma \neq 1$ as well.

induce capital-poor agents to vote for a higher capital income tax, although this discourages savings and thus investment-driven growth[17]. With respect to the voting equilibrium, proposition 3 suggests that economies populated with status-oriented agents may choose high levels of redistribution through *distortionary* taxation, since lump-sum redistribution may not be feasible[18].

4.3. Status and Preferred Growth Conditional on Relative Factor Endowments

Now changes in status preferences and its impact on preferred redistribution policies conditional on the relative factor endowment of the decisive voter are considered.

Proposition 4: For (6), (7) with $\beta^i=\beta$ for all i and $\sigma=1$: If $\xi^i<1$ and $\vartheta^i>0$, then $\partial^2\vartheta^i/\partial\beta\partial\xi^i>0$, i.e. the negative impact of a higher status preference on the preferred growth rate of a capital-poor agent is smaller the higher the relative factor endowment.

Proof: Appendix B.

The intuition of proposition 4 lies in the fact that the trade-off between status and growth for a capital-poor agent becomes worse the lower the relative factor endowment[19]. Hence, the negative impact of a rise in status-orientation on growth through redistribution of factor income tends to be larger in more unequal societies. Similarly, if capital becomes more unequally distributed, this impact tends to be larger in economies populated with more status-oriented agents.

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[17] Disaggregating capital (i.e. explicitly distinguishing human and physical capital) in this type of model does not yield further insights about the impact of status-seeking on taxation. This is because in steady state equilibrium the *after-tax returns* of all accumulated factors must be *equal*. Each individual is thus indifferent to invest in either type of capital, such that status concerns cannot be a motive to vote for distortionary taxation with respect to different types of capital. Hence, viewing the accumulated factor as broad capital merely simplifies the analysis above without changing the results as long as at least one production factor is in fixed supply.

[18] Proposition 3 may be compared with the results of a recent paper by Corneo and Grüner (1997). They consider an environment in which more economic inequality allows middle-class individuals to reduce competition with poor agents in the social sector (with respect to marriage as in Cole, Mailath and Postlewaite, 1992). Unlike proposition 3, if inequality has an informational value, status-oriented middle-class voters may be willing to provide political support to conservative taxation programs.

[19] (16) implies that $(\partial^2 S^i)/(\partial\vartheta\,\partial\xi^i)=[\rho-(1-\beta)(1-\sigma)a]\,l^i/(a-\vartheta)^2>0$. Thus, like proposition 3, also proposition 4 should hold for $\sigma\neq1$. Again, this is not shown due to the messy algebra.

5. Discussion

The impact of status concerns on growth may crucially depend on the assumption about how status is achieved. Hence, in this section the results of this paper are contrasted with the impacts of alternative status preferences.

First, one could imagine that education or occupation directly enters the utility function as an indicator for social standing. For instance, Fershtman, Murphy and Weiss (1996) assume that status depends on both the average wage and the proportion of skilled workers in someone's occupation group. If the demand for status increases with wealth, growth is discouraged by status preferences since workers with high wealth but not necessarily with high ability acquire schooling. Second, both Cole, Mailath and Postlewaite (1992) and Corneo and Jeanne (1997) consider the impacts of relative wealth preferences. In their models individual asset accumulation and thus investment-driven growth positively depend on such relative wealth concerns. Thus, whether individuals care about their relative standing in form of *relative consumption* or about their *relative wealth* (which could also be interpreted as the *relative education level* if the accumulated factor is human capital) is crucial to the impact of status-seeking on savings behavior. In my model, (human or physical) capital investment has only an indirect effect on status by lowering (relative) consumption today and increasing it in the future.

Similarly, voting equilibria with respect to tax policies are likely to depend on the definition of status. For instance, if status is *only* determined by relative wealth, in a balanced growth equilibrium each individual accumulates (human) capital at the same rate, such that status cannot be improved by voting for distortionary taxation. However, if in addition relative consumption concerns are present in this type of growth model, distortionary taxation effects are unambiguously encouraged if the median voter is capital-poor.

6. Conclusion

This paper has explored the impact of people's concern about their *relative consumption level* on both savings behavior and voting behavior with respect to tax policies in a simple general equilibrium framework with endogenous growth and majority voting.

If agents behave fully rational, individual saving rates were shown to be ambiguously affected by status preferences in an equilibrium with steady investment-driven growth, depending on the degree of relative risk aversion. However, allowing for endogenous redistribution policy, each agent has a motive to vote for policies that improve status. If the decisive (i.e. median) voter is capital-poor relative to the representative agent of the economy, redistribution from capital to labor income rises with his/her status preference, although that reduces the growth rate of wages unambiguously. This is because in the presence of status-seeking, individuals may face a trade-off between their status and overall economic growth. Hence, societies can have different redistribution levels despite similar levels of pre-tax inequality. Some authors argue that the ambition to grow has diminished in the developed world (e.g. Falkinger, 1986). In my model, this would mean that status-orientation has risen, implying a greater emphasis on redistribution policies in the political process. However, this does not necessarily imply that growth is diminished since the direct effect of status preferences on savings may counter this indirect effect if the intertemporal elasticity of substitution is sufficiently low[20]. Hence, the model is capable of *simultaneously* explaining the relatively high saving rates and high levels of redistribution in many Western European countries compared to low savings and little redistribution in, for instance, the U.S. economy. Since the model suggests that these patterns are due to cultural differences, future research should aim to endogenize relative consumption preferences like Cole, Mailath and Postlewaite (1992) have done to derive their 'status-is-wealth' equilibria.

Appendix

A. Derivation of Individual Consumption Growth (8)

The current-value Hamiltonian function for the utility maximization problem of an individual denoted i, given his/her initial capital endowment $k_0^i > 0$, is

$$\tilde{H}(c^i, k^i, \lambda^i) = \frac{(c^i / C^{\beta^i})^{1-\sigma} - 1}{1-\sigma} + \lambda^i (wl^i + rk^i - c^i), \tag{A.1}$$

where λ^i is the current-value shadow price of individual income of the non-accumulated factor. The first-order conditions

$$\frac{\partial \tilde{H}^i}{\partial c^i} = 0 \;\Leftrightarrow\; \lambda^i = (c^i)^{-\sigma} / C^{(1-\sigma)\beta^i}, \tag{A.2}$$

$$-\frac{\partial \tilde{H}^i}{\partial k^i} = \dot{\lambda}^i - \rho \lambda^i \;\Leftrightarrow\; -\hat{\lambda}^i = r - \rho \tag{A.3}$$

and the transversality condition $\lim_{t \to \infty} e^{-rt} k^i(t) = 0$ [where the latter holds because of $r > \vartheta$ according to (11)] are necessary and sufficient for a maximum

[20] Indeed, most empirical studies estimate the intertemporal elasticity of substitution to be lower than unity, e.g. Hall (1988).

because of the concavity of $\tilde{H}$ (for all C) and positive discounting (i.e. $\rho > 0$). Differentiating (A.2) with respect to time yields

$$(\text{A.4}) \qquad -\hat{\lambda}^i = \sigma \hat{c}^i + (1-\sigma)\beta^i \hat{C}.$$

Combining (A.3) and (A.4) gives equation (8). □

B. *Proof of Propositions 2 to 4*

Proof of proposition 2:

Using the first-order condition for a maximum of the indirect utility function V^i in (17) with respect to ϑ (neglecting the restrictions on the tax rates for a moment), $\tilde{\vartheta}^i = \arg\max_{\vartheta} V^i$ is implicitly defined by

$$(\text{B.1}) \qquad \begin{aligned} F(\bullet) \equiv & -\left[(1-\beta)(1-\sigma)\xi^i + \sigma(1-\beta)+\beta)\right]\left[\rho-(1-\beta)(1-\sigma)\tilde{\vartheta}^i\right](a-\tilde{\vartheta}^i) \\ & + \left\{(1-\beta)(a-\tilde{\vartheta}^i) + \beta\left[\rho-(1-\beta)(1-\sigma)\tilde{\vartheta}^i\right]\right\} \\ & \cdot \left\{\left[\rho-(1-\beta)(1-\sigma)\tilde{\vartheta}^i\right]\xi^i + a - \rho - \tilde{\vartheta}^i\left[\sigma(1-\beta)+\beta\right]\right\} = 0. \end{aligned}$$

This expression has the quadratic form $F(\cdot) = x(\tilde{\vartheta}^i)^2 + y\tilde{\vartheta}^i + z = 0$, where $x = (\sigma-1)(\bar{\xi}^i - \xi^i)(1-\beta)^2[\sigma(1-\beta)+\beta]$ with $\bar{\xi}^i$ as given in section 4. If the second-order condition for a maximum holds, then $x > 0$. This is because if $\sigma > 1$, all individuals with $\xi^i < \bar{\xi}^i$ do not face a trade-off between initial consumption and growth (see main text) and thus vote for the maximal feasible growth rate $\vartheta^{\max}$. If $\beta > 0$, one finds two roots for $\tilde{\vartheta}^i$ in (B.1). To see which one is the relevant root, consider the benchmark case $\beta = 0$. According to (B.1), if $\beta = 0$, then $\tilde{\vartheta}^i = \dfrac{\rho(\xi^i - 1) + \vartheta^{\max}}{(1-\xi^i)\sigma + \xi^i}$ [with $\vartheta^{\max} = (a-\rho)/\sigma$], $x = \sigma[\sigma(1-\xi^i) + \xi^i]$ and $y = -x(a + \tilde{\vartheta}^i)$. Note that $y < 0$ if and only if $x > 0$. This implies $2\tilde{\vartheta}^i x + y = -x(a - \tilde{\vartheta}^i) < 0$. Hence, dealing with real roots of (B.1), only the smaller root can be a solution if $\beta > 0$, implying

$$(\text{B.2}) \qquad \frac{\partial F(\bullet)}{\partial \tilde{\vartheta}^i} = 2\tilde{\vartheta}^i x + y < 0 \quad \text{for all } \beta \geq 0.$$

Furthermore, one obtains

$$(\text{B.3}) \qquad \begin{aligned} \frac{\partial F(\bullet)}{\partial \xi^i} = & \left[\rho-(1-\beta)(1-\sigma)\tilde{\vartheta}^i\right] \\ & \cdot \left\{\sigma(1-\beta)(a-\tilde{\vartheta}^i) + \beta\left[\rho-(1-\beta)(1-\sigma)\tilde{\vartheta}^i\right]\right\} \end{aligned}$$

which is strictly positive according to (11). Hence, applying the implicit function theorem, $\frac{\partial \tilde{\vartheta}^i}{\partial \xi^i} > 0$ using (B.2) and (B.3). Finally, confirming from (B.1) that $\tilde{\vartheta}^i = (a-\rho)/[\sigma(1-\sigma)+\beta] = \vartheta^{\max}$ if $\xi^i = 1$ concludes the proof of proposition 2. □

Proof of propositions 3 and 4:

If $\sigma = 1$, then (B.1) becomes

$$F(\cdot) \equiv (1-\beta)(a-\tilde{\vartheta}^i)^2 + (1-\beta)\rho(\xi^i - 2)(a-\tilde{\vartheta}^i) + \beta\rho^2(\xi^i - 1) = 0. \tag{B.4}$$

Thus, one gets an explicit solution for $\tilde{\vartheta}^i$ given by

$$\tilde{\vartheta}^i = a - \rho + (\rho/2)\left[\xi^i - \sqrt{(2-\xi^i)^2 + 4\big(\beta/(1-\beta)\big)(1-\xi^i)}\right] \tag{B.5}$$

(which is again the smaller root). Both proposition 3 and 4 follow by partially differentiating (B.5). □

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Abstract

This paper explores the impact of status orientation on both savings behavior and factor income redistribution in an endogenous growth model with majority voting. If a steady state exists, in an equilibrium for given policy variables the effect of status preferences on investment-driven growth depends on the degree of relative risk aversion. Allowing for endogenous tax policies, *desired* saving incentives and thus growth rates are altered by status concerns, i.e. redistributive capital income tax rates rise with status orientation of the (capital-poor) median voter, unambiguously depressing growth.

Kurzfassung

Dieser Beitrag untersucht die Wirkung von Statusorientierung auf das individuelle Sparverhalten sowie auf das Wahlgleichgewicht bzgl. der Besteuerung von Faktoreinkommen in einem endogenen Wachstumsmodell. Falls ein Steady state existiert, ist im Gleichgewicht bei exogener Steuerpolitik die Wirkung von Statuspräferenzen auf die Ersparnisbildung (und somit auf die Wachstumsrate) abhängig vom Grad der relativen Risikoaversion der Individuen. Mit endogener Steuerpolitik nimmt die Umverteilung von Kapital- zu Arbeitseinkommen im Mehrheitswahlgleichgewicht mit der Statusorientierung eines (relativ wenig mit Kapital ausgestatteten) Medianwählers zu, obwohl dies zu einer Verlangsamung des Lohnwachstums führt.

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