Wealth distribution, endogenous fiscal policy and growth: status seeking implications

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Abstract
We investigate the wealth distribution and endogenous fiscal policy in a two-classes growth model in which individuals exhibit a desire for social status. The latter is increasing with individual wealth and decreasing with the average level of the society. First, we show that the status seeking, and not the wealth endowment, is crucial in determining the long-run wealth distribution: agents with higher status motive will hold a larger share of total wealth. Second, a higher inequality can be associated with a higher growth if it is due to a stronger incentive to accumulate wealth of one class of agents. Third, the model implies that a higher growth rate may reduce welfare of one class of agents and raise welfare of the other one. Finally, when fiscal policy is determined through a voting mechanism, higher status motive of majoritarian class may reduce political equilibrium growth.

Keywords: Endogenous growth; endogenous fiscal policy; status seeking; wealth distribution; individual welfare

JEL Classification: D31; H31; H50; O41

1 Introduction
The relative utility hypothesis, which supposes that individuals care about the social aspect of wealth accumulation in addition to caring about consumption, is supported in numerous empirical investigations (see e.g. Clark and Oswald, 1996; Kapteyn, Van de Geer, Van de Stadt and Wansbeek, 1997, McBride, 2001). It is shown that an individual well-being depends both positively on her wealth and negatively on a reference level of the society. This relative utility hypothesis allows to explain many economic phenomena. For instance, it is used by Easterlin (1974) to explain the paradox that individual welfare is increasing with her

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personal income while the average welfare remains independent of the material standard of living. Long and Shimomura (2004) claim that the desire for wealth-enhanced social status can explain the catching-up process of rich people by poor people.

The conjecture that wealth accumulation yields social status and that status matters for individual welfare has been emphasized in The Theory of Moral Sentiments (Smith, 1759). In The Theory of the Leisure Class, Veblen (1899) has focused on the role of conspicuous consumption in signalling social status. The social aspect of consumption is also found in The Social Limits to Growth (Hirsch, 1976). Recently, the role of social rewards as motive of individual behavior has been incorporated into models of economic growth. By considering preferences for social status, economists emphasize the role of the demand side, which is determined by individual preferences, as determinant of economic growth, apart from the role of the supply side. For example, Corneo and Jeanne (2001a) showed that the desire for social status can generate endogenous long-run growth.

This paper introduces status preferences into an endogenous growth model with public sector. It builds on the conventional framework of Glomm and Ravikumar (1994), where fiscal policy financing public capital is endogenously determined through a voting mechanism. The implications of status-seeking behavior on wealth distribution, endogenous fiscal policy as well as political equilibrium growth are investigated. We also discuss the relationship between individual welfare and growth in this economy where agents exhibit a desire for status.

The setting is a two-classes endogenous growth model where agents care about both consumption and social status, which is an increasing function of both their absolute and relative wealth. Agents are heterogeneous in two aspects: wealth endowment and strength of status-seeking motive. In the framework without status consideration, Glomm and Ravikumar (1994) showed the income convergence in the long run. In our model, we first show that the status-seeking behavior, and not the wealth endowment, is crucial in determining the long-run wealth distribution: agents with higher status motive will hold a larger share of the total wealth. For the same incentive in wealth accumulation, agents end up holding the same quantity of wealth. In other words, the conclusion in the conventional model is a particular case of our model for which status motive of both types of agents is identical and equal to zero. Second, it is shown that higher inequality can be associated with higher growth if it is due to higher incentive to accumulate wealth of one group of agents.

The introduction of status preferences implies that a higher growth rate may reduce welfare of one group of agents and raise that of other one. Finally, when the fiscal policy is endogenously determined through a voting mechanism, higher status motive of majoritarian class may reduce the political equilibrium growth while higher status motive.

The paper proceeds as follows. The next section lays out the modeling framework with status-seeking agents. Section 3 presents the steady state analysis under exogenous public policy. Section 4 adds endogenous public policy, via a voting mechanism and studies the

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1Social status of an individual can be defined by her relative wealth (Corneo and Jeanne, 1997, 2001a,b; Long and Shimomura, 2004), relative consumption (Rauscher, 1997; Fischer and Hof, 2000). Furthermore, Fershtman et al. (1996) define social status as the human capital accumulation.
effect of status-seeking on the political equilibrium growth. Section 5 concludes.

2 A model with status-seeking agents

We develop the model of Glomm and Ravikumar (1994) including status-seeking behavior. Let assume that the economy has two groups of agents. The population size is \( \delta \) for the first group, and \( 1 - \delta \) for the second group. The size of each agent in her group is identical. At \( t = 0 \), agent belonging to the group \( i \) owns the amount of wealth in terms of capital \( k_{i,0} > 0 \), for \( i = 1, 2 \).

Each individual cares about both consumption \( (c_{it}) \) and social status, which increases with her wealth \( (k_{it}) \) and decreases with the average level in the society \( (k_t) \). The intertemporal utility function for agent \( i \) is

\[
U(c_{it}, k_{it}, k_t) = \sum_{t=0}^{\infty} \beta^t \left[ (1 - s_i) \ln c_{it} + s_i \ln \left( \frac{k_{it}}{k_t^\theta} \right) \right], \quad i = 1, 2
\]

where \( 0 < \beta < 1 \), \( k_t = \delta k_{1t} + (1 - \delta) k_{2t} \). The utility from consumption is represented by \( \ln (c_{it}) \). The utility from social status is represented by \( \ln \left( \frac{k_{it}}{k_t^\theta} \right) \). The parameter \( s_i \) is in the interval \([0; 1)\), and measures the importance of agent \( i \)'s utility from social status (i.e. strength of status-seeking motive) as compared to the importance of her utility from consumption.\(^2\) This specification of utility formalizes the assumption that wealth accumulation gives satisfaction to agent \( i \) through an improvement of her social status. Notice that the status utility can be written as:

\[
\ln \left( \frac{k_{it}}{k_t^\theta} \right) = (1 - \theta) \ln (k_{it}) + \theta \ln \left( \frac{k_{it}}{k_t} \right)
\]

It so happens that there are two components in the status utility: absolute wealth and relative wealth. The parameter \( \theta \) represents the weight assigned to relative wealth, and \( 1 - \theta \) the weight assigned to absolute wealth in the individual quest for status. Different from most existing studies, such a specification of status utility does not give generally the same weight to an increase in individual wealth and to a decrease in the average level of wealth.\(^3\) In addition, \( \theta \) may be interpreted as the degree of the individual’s social interaction (Jellal and Rajhi, 2003).

The output \( y_{it} \), for any \( t \geq 0 \) is produced following the Cobb-Douglas production technology

\[
y_{it} = AZ_t^\alpha k_{it}^{1-\alpha} l_{it}^\alpha,
\]

where \( A > 0 \) and \( \alpha \in (0, 1) \) are constant parameters. The aggregate variable \( Z_t \), which is the stock of public capital at \( t \), is assumed to be a pure public good. The variables \( k_{it} \) and \( l_{it} \) are

\(^2\) We exclude the case with \( s_i = 1 \) to avoid the extreme situation where social status is all-important and consumption does not give any satisfaction.

\(^3\) For instance, the status function depending only on relative wealth is proposed in Corneo and Jeanne (1997), Futagami and Shibata (1998), Long and Shimomura (2004), while the status function depending only on absolute wealth is proposed in Zou (1994), Gong and Zou (2002) and Hosoya (2002).
private capital and labor force respectively. Each individual is assumed to supply one unit of labor force inelastically.

Both public and private capital are assumed to depreciate fully in one period. Therefore, private capital obtained by agent $i$ at period $t + 1$ is equal to her investment at $t$, $i_{it}$

$$k_{it+1} = i_{it}.$$ 

Public capital at time $t + 1$ is equal to public investment at $t$, $I_t$

$$Z_{t+1} = I_t^p,$$ 

where $I_t$ is financed by taxing individual incomes at rate $\tau$, and the government’s budget is therefore balanced each period:

$$I_t^p = \tau AZ_t^\alpha \left[ \delta k_{1,t}^{1-\alpha} l_{1,t}^\alpha + (1 - \delta) k_{2,t}^{1-\alpha} l_{2,t}^\alpha \right]$$ 

The initial state of public capital $Z_0$ is exogenous.

Individual $i$ chooses $\{c_{it}, k_{it+1}\}_{t=0}^\infty$ by resolving the following program:

$$\max_{\{c_{it}, k_{it+1}\}_{t=0}^\infty} \sum_{t=0}^\infty \beta^t \left[ (1 - s_i) \ln (c_{it}) + s_i \ln \left( \frac{k_{it}}{l_t} \right) \right]$$

s.t.

$$c_{it} + k_{it+1} = (1 - \tau) AZ_t^\alpha k_{it}^{1-\alpha} l_{it}^{\alpha},$$

$$c_{it}, k_{it+1} \geq 0,$$

$$l_{it} = 1,$$

given $k_{i0}, Z_0$ and $\{\tau_t, Z_{t+1}\}_{t=0}^\infty$

The first order conditions for an interior solution are the following

$$\frac{(1 - s_i) \beta^t}{c_{it}} = \lambda_t,$$ 

$$\lambda_{t+1} (1 - \tau) AZ_t^\alpha k_{it+1}^{1-\alpha} = \lambda_t - \frac{s_i \beta^{t+1}}{k_{it+1}}.$$ 

Eqs. (5) and (6) give

$$c_{it} = \frac{\beta (1 - \alpha) (1 - \tau) AZ_t^\alpha k_{it-1}^{1-\alpha} c_{it-1}}{k_{it} - \frac{s_i \beta^t}{1 - s_i} c_{it-1}},$$ 

$$k_{it+1} = (1 - \tau) AZ_t^\alpha k_{it}^{1-\alpha} \left( 1 - \frac{\beta (1 - \alpha) c_{it-1}}{k_{it} - \frac{s_i \beta^t}{1 - s_i} c_{it-1}} \right).$$ 

The transversality condition is: $\lim_{t \to \infty} \lambda_t k_{it+1} = \lim_{t \to \infty} (1 - s_i) \beta^t k_{it+1}/c_{it} = 0$, where $\lambda$ is the shadow price of wealth. The first order conditions are also sufficient for a maximum since the Lagrangian is concave.

Given the initial $k_{i0}, Z_0$ and an arbitrary fiscal policy implemented in each period, an intertemporal equilibrium is the sequence of consumption, private capital and labor force such that

- $l_{it} = 1$ and $\{c_{it}, k_{it+1}\}_{t=0}^\infty$ is given by Eqs. (7), (8), for $i = 1, 2$
- $c_{it} + k_{it+1} = (1 - \tau) AZ_t^\alpha k_{it}^{1-\alpha}$, and $Z_{t+1} = \tau AZ_t^\alpha \left[ \delta k_{1,t}^{1-\alpha} + (1 - \delta) k_{2,t}^{1-\alpha} \right]$
- $k_t = \delta k_{1t} + (1 - \delta) k_{2t}$ for any $t \geq 0$. 

3
3 Steady state analysis

Let us define new variables

\[ X_{i,t+1} = \frac{k_{i,t+1}}{c_{it}}, \quad W_{t+1} = \frac{Z_{t+1}}{c_{it}}, \quad R_{ji,t+1} = \frac{k_{j,t+1}}{k_{i,t+1}} \quad \text{for } i,j = 1,2 \text{ and } t \geq 0. \]

Then combining equations (7), (8), and equation \( Z_{t+1} = \tau A Z_t^\alpha \left[ \delta k_{1,t}^{1-\alpha} + (1-\delta) k_{2,t}^{1-\alpha} \right] \) gives the system

\[
\begin{align*}
X_{i,t+1} &= \frac{1}{\beta (1-\alpha)} X_{it} - \frac{1 + s_i \alpha - \alpha}{(1-s_i)(1-\alpha)} , \\
R_{ji,t+1} &= R_{ji,t} \left( 1 - \frac{\beta (1-\alpha)}{X_{jt} - \frac{s_j \beta}{1-s_j}} \right) \left( 1 - \frac{\beta (1-\alpha)}{X_{it} - \frac{s_i \beta}{1-s_i}} \right) , \\
W_{1,t+1} &= \frac{\tau}{(1-\tau)(1-s_1)} \left( X_{it} - \frac{s_1 \beta}{1-s_1} \right) \left( \delta + (1-\delta) R_{21,t}^{1-\alpha} \right) , \\
W_{2,t+1} &= \frac{\tau}{(1-\tau)(1-s_2)} \left( X_{it} - \frac{s_2 \beta}{1-s_2} \right) \left( \delta R_{12,t}^{1-\alpha} + 1 - \delta \right). 
\end{align*}
\]

In the following, we restrict our attention to steady-state analysis in which all variables (consumption, private capital, public capital) grow at the same rate \( g \). The steady state of the economy is given by

\[
\begin{align*}
X_i &= \frac{\beta}{1-s_i} h(s_i) , \\
R_{ji} &= \frac{h(s_j)^{1/\alpha}}{h(s_i)^{1/\alpha}} , \\
W_1 &= \frac{\tau}{(1-\tau)(1-s_1)} \left( \frac{1 + \beta s_1 - s_1}{1 + \alpha \beta - \beta} \right) \left( \delta + (1-\delta) R_{21}^{1-\alpha} \right) , \\
W_2 &= \frac{\tau}{(1-\tau)(1-s_2)} \left( \frac{1 + \beta s_2 - s_2}{1 + \alpha \beta - \beta} \right) \left( \delta R_{12}^{1-\alpha} + 1 - \delta \right) .
\end{align*}
\]

where \( h(s_i) = \frac{1 + \alpha s_i - \alpha}{1 + \beta s_i - s_i} \) for \( i,j = 1,2 \).

3.1 Wealth distribution and status-seeking

Let \( q_1 \) as be the share of total wealth held by agent 1. We can write \( k_{1t+1} = q_1 k_{t+1} \) and \( k_{2t+1} = q_2 k_{t+1} \), for any \( t \geq 0 \), with \( q_2 = (1-\delta q_1) / (1-\delta) \).

**Proposition 1 (Steady state wealth distribution)**

i). The share of total wealth held by agent \( i \) is larger than that held by agent \( j \) if agent \( i \)'s status motive is stronger than agent \( j \)'s status motive

\[ q_i \geq q_j \text{ if } s_i \geq s_j. \] (17)

ii). An increase in agent \( i \)'s status motive yields larger her share of total wealth and lower agent \( j \)'s share of total wealth

\[ \frac{\partial q_i}{\partial s_i} > 0 \text{ and } \frac{\partial q_j}{\partial s_i} < 0 \text{ for } i,j = 1,2. \] (18)
Proof. i) We have

\[
\begin{align*}
q_1 &= \frac{h(s_1)^{1/\alpha}}{h(s_2)^{1/\alpha}}, \\
q_2 &= \frac{1}{1 - \delta + \delta h(s_1)^{1/\alpha} h(s_2)^{-1/\alpha} + \delta h(s_1)^{1/\alpha} h(s_2)^{-1/\alpha} - 1}, \\
\delta q_1 + (1 - \delta) q_2 &= 1
\end{align*}
\]

where the first equation of the above system comes from Eq. (14) by considering \( R_{12} = q_1/q_2 \).

This system gives us

\[
q_1 = \frac{h(s_1)^{1/\alpha} h(s_2)^{-1/\alpha}}{1 - \delta + \delta h(s_1)^{1/\alpha} h(s_2)^{-1/\alpha} - 1}, \\
q_2 = \frac{1}{1 - \delta + \delta h(s_1)^{1/\alpha} h(s_2)^{-1/\alpha} - 1}.
\]

Notice that

\[
\frac{\partial h(s)}{\partial s} = \frac{\alpha (1 + \beta s - s) + (1 - \beta) (1 + \alpha s - \alpha)}{(1 + \beta s - s)^2} > 0.
\]

Therefore if \( s_1 > s_2 \), this implies \( h(s_1) > h(s_2) \). We obtain then \( h(s_1)^{1/\alpha} h(s_2)^{-1/\alpha} > 1 \). This means that if the status-seeking motive of agent 1 is stronger than that of agent 2, then at the steady-state, agent 1 holds a higher share of total wealth.

ii) It is straightforward to verify that

\[
\frac{\partial q_1}{\partial s_1} = \frac{(1 - \delta) h(s_1)^{1/\alpha} h(s_2)^{-1/\alpha}}{\alpha (1 - \delta + \delta h(s_1)^{1/\alpha} h(s_2)^{-1/\alpha})} \frac{\partial h(s_1)}{\partial s_1} > 0,
\]

\[
\frac{\partial q_2}{\partial s_1} = \frac{-\delta h(s_1)^{1/\alpha} h(s_2)^{-1/\alpha}}{(1 - \delta + \delta h(s_1)^{1/\alpha} h(s_2)^{-1/\alpha})^2} \frac{\partial h_1}{\partial s_1} < 0 \text{ as } \frac{\partial h_1}{\partial s_1} > 0.
\]

By analogy with above derivatives, we obtain \( \partial q_2/\partial s_2 > 0 \) and \( \partial q_1/\partial s_2 < 0 \).

Proposition 1 shows that wealth endowment plays no role in the long-run wealth distribution. Instead, the status behavior is crucial in explaining the long-run wealth divergence. Our finding underlines the cause of wealth divergence through the status behavior: agents end up holding the same quantity of wealth if they have the same incentive to accumulate wealth (i.e. \( s_1 = s_2 \)). Such a result is explained by the following intuition. On the one hand, the marginal status utility of wealth being equal to the term \( 1/k_{it} \), it is decreasing with \( k_{it} \). This means that poor people get more satisfaction from a marginal increase in wealth than rich people. On the other hand, a higher value of \( s_i \) corresponds to a higher importance of agent \( i \)'s utility from social status as compared to her utility from consumption. This implies a stronger incentive to accumulate wealth. Therefore, given wealth endowment with \( k_{1,0} < k_{2,0} \) for example, if \( s_1 = s_2 \), agent 1 will catch up with agent 2 as she gets more satisfaction from a marginal increase in wealth. If \( s_1 > s_2 \), that means that agent 1 is more incated to accumulate wealth than agent 2. She catch-ups with agent 2 before to hold a larger share of total wealth.\(^4\)

\(^4\)This conclusion is close to the well known work by Ramsey (1928) using a model without status seeking. Ramsey shows that if the subjective discount rate differs across agents, the most patient will hold all the wealth. Indeed, if agent \( i \) has a discount rate lower than agent \( j \), it means that agent \( i \) cares about his future life more seriously, and thus his saving incentive becomes higher. He end ups holding the total of wealth.
The conclusion in Glomm and Ravikumar’s model concerning income convergence is overturned including the status behavior. Glomm and Ravikumar (1994) show that the savings rate is constant across agents and that wealth inequality declines over time, and then all agents have the same wealth in the long run. This result corresponds to the case where \( s_1 = s_2 = 0 \) in our model. In addition, the similar result can be found in a growth model of Glomm and Ravikumar (1992) with education expenditures. These authors show that in public education regime, the growth rate of any agent’s income is inversely related to the level of her income. Thus agents with income below the average grow faster than agents with income above the average, and then incomes end up by converging over time.\(^5\)

The finding indicated in Proposition 1 is in line with the sociological theory explaining the poverty by individual negative attitudes (lack of effort, loose of morals, etc.). However, it contrasts with the theory explaining the poverty by social pattern (such as lack of equal opportunity, that we can interpret as unequal initial wealth in our model)\(^6\). Our finding suggests that redistributive policy taxing agents with higher status motive and subsidizing agents with lower status motive is not a good solution for the economy as the poverty does not stem from the lack of equal opportunity. Such policy may discourage wealth accumulation of agents with high effort. A government intervention regarding individual preferences may be preferable, however this type of intervention is rather complex because it should act to “modify” individual motivation, or preferences.

We should note that growth models including status-seeking generate different conclusions concerning wealth distribution, and it is partially due to the difference in hypothesis. For instance, Futagami and Shibata (1998) examine a growth model where the subjective discount rate differs across agents and relative wealth determines social status. These authors conclude that even less patient agents could hold a positive share of the total wealth because utility from their relative wealth position decreases until they catch up with more patient agents. In an exogenous growth model, Long and Shimomura (2004) claim that “if the elasticity of marginal utility of relative wealth is greater than the elasticity of marginal utility of consumption (...). Thus eventually they will be able to catch up with the rich” (p. 535). This catching-up is found in our model only when \( s_1 = s_2 \). On the contrary, Corneo and Jeanne (1999) found the persistence inequality in a two-class growth model in which agents care about the social perception of their wealth rank as determinant of their social status. This result is not inconsistent with ours, because the difference of specification in both models. Actually, the total marginal return on savings, in terms of consumption and esteem, is identical for a poor and a rich individual in Corneo and Jeanne (1999). In addition, the marginal status utility of wealth is assumed to be identical for two types of agents while it is concave in our model. Their specification implies that poor and rich people have the same wealth accumulation.

\(^5\)In the contrary, Cardak (1999) find that households’ preferences for education determine their long-run position in the income distribution by introducing heterogeneous preferences for education in the framework of Glomm and Ravikumar (1992). Households with the strongest preference for education will have the greatest income, independent of initial conditions.

\(^6\)See for example Kluegel et al. (1995) and Kreidl (1998) for other explanatory factors about income divergence.
incentive, and wealth inequality remains constant overtime.

### 3.2 Long-run growth and status-seeking

The constant value of $W_i = Z/c_i$ and $X_i = k_i/c_i$ at the steady state implies that all variables grow at the same rate $g$ which is given equal to $\ln \left( \frac{Z_{t+1}}{Z_t} \right)$

$$g = \ln (\tau A) + \ln \left[ \delta \left( \frac{k_1}{Z} \right)^{1-\alpha} + (1-\delta) \left( \frac{k_2}{Z} \right)^{1-\alpha} \right]$$

where $\frac{k_1}{Z} = \frac{\beta (1-\tau)}{\tau} \frac{h(s_1)}{\delta + (1-\delta) R_{21}^{1-\alpha}}$ and $\frac{k_2}{Z} = \frac{\beta (1-\tau)}{\delta R_{12}^{1-\alpha} + 1-\delta} \frac{h(s_2)}{\tau}$.

**Proposition 2** The steady state growth rate of the economy is given by

$$g = \ln \left( A^{\beta^{1-\alpha}} \right) + (1-\alpha) \ln (1-\tau) + \alpha \ln \tau + \ln \left[ \delta B_1^{1-\alpha} + (1-\delta) B_2^{1-\alpha} \right] \tag{19}$$

where

$$B_1 = \frac{h(s_1)}{\delta + (1-\delta) R_{21}^{1-\alpha}} \quad \text{and} \quad B_2 = \frac{h(s_2)}{\delta R_{12}^{1-\alpha} + 1-\delta}$$

$$R_{ij} = \left( \frac{h_i}{h_j} \right)^{1/\alpha} \quad \text{and} \quad h(s_i) = \frac{1+\alpha s_i - \alpha}{1+\beta s_i - s_i} \quad \text{for} \ i, j = 1, 2.$$

Notice that the impact of fiscal policy on growth rate is exerted by two terms $\alpha \ln \tau$ and $(1-\alpha) \ln (1-\tau)$. The first one represents the positive effect of public capital on the private capital marginal product and the second one represents the negative effect of taxation on net benefit rate of saving. The endogenization of individual preferences allows us to take into account individual’s action. It is exerted by the last term.

Figure 1 illustrates the growth rate at asymmetric and symmetric steady state. Each agent has an individual specific growth rate, determined by Eqs. (20) and (21):

$$g_1 = \ln A^{\beta^{1-\alpha}} + \ln (1-\tau)^{1-\alpha} \tau^{\alpha} + (1-\alpha) \ln h_1 + \alpha \ln \left[ \delta + (1-\delta) \left( \frac{q_2}{q_1} \right)^{1-\alpha} \right] \tag{20}$$

$$g_2 = \ln A^{\beta^{1-\alpha}} + \ln (1-\tau)^{1-\alpha} \tau^{\alpha} + (1-\alpha) \ln h_2 + \alpha \ln \left[ \delta \left( \frac{q_1}{q_2} \right)^{1-\alpha} + 1-\delta \right] \tag{21}$$

The decreasing curve represents the wealth growth rate of agent 1, which is decreasing with $q_1$. The increasing curve represents the wealth growth rate of agent 2, which is decreasing with $q_2$. The intersection point between both curves gives the value of growth rate in the long run, written in Eq. (19). The graph on the left hand side of figure 1 represents the growth rate at an asymmetric steady state (non-egalitarian wealth distribution) with $q_1 > q_2$ corresponding to $s_1 > s_2$. The graph on the right hand side represents the symmetric case (egalitarian wealth distribution) when $s_1 = s_2$. 

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Figure 1. The growth rate at the asymmetric and symmetric steady state.

Figures 2 and 3 give a representation of the wealth-public capital ratio $k/Z$ and a representation of the growth rate in function of $s_1$ and $s_2$.

Figure 2: Wealth-public capital ratio as a function of $s_1$ and $s_2$

$(\alpha = 0.7, \beta = 0.8, \delta = 0.4, \tau = 0.3)$
It so happens that status-seeking has a positive impact on total wealth accumulation and growth rate. Intuitively, the higher is the parameter $s_i$, for $i = 1, 2$, the stronger is the importance that agent $i$ assigns to social status as compared to consumption in her quest for satisfaction. Therefore, she is more incited to accumulate wealth. This implies an increase in the quantity of the total wealth, which has a positive impact on growth.

It should be noticed that an increase in wealth inequality might accompany either a higher growth rate or a lower growth rate. For instance, from a symmetric situation where $s_1 = s_2$ corresponding to $q_1 = q_2$, the first possibility will be held when there is an increase in status motive of agent $i$ while agent $j$’s status motive remains unchanged. This increase of $s_i$ leads to a higher growth rate corresponding to a non-egalitarian wealth distribution in favor of agent $i$. This new situation is preferred than the symmetric situation in terms of growth. The possibility that wealth inequality accompanies a lower growth rate will be held when there is a decrease in agent $i$’s status motive, then a decrease in her incentive to accumulate wealth. This reduces the total wealth in the society, which has a negative effect on growth.

In other words, higher inequality due to stronger incentive to accumulate wealth of one group of agents may be consistent with a higher growth. With this result, status-seeking behavior can be considered as an explaining argument, among others, for recent empirical studies on emerging Asian economies such as Viet Nam and China, which indicate that strong growth is associated with a fall in poverty and a rise in inequality (see e.g. Justino and Litchfield, 2003; Benjamin et al., 2004).
3.3 Welfare and long-run growth

We investigate now the growth effect on lifetime utility of each agent. Notice that

\[
\ln v_t = \ln v_{i0} + gt, \quad \text{where} \quad v = c, k, k, \text{ for } t > 0 \tag{22}
\]

and

\[
c_{i0} = (1 - \tau) Ay_{i0} - k_{i1} = (1 - \tau) Ay_{i0} - k_{i0} \exp g \tag{23}
\]

Substituting Eqs. (22), and (23) into Eq. (1), the lifetime of agent \(i\) is given by

\[
U_i = (1 - s_i) \ln \left\{ (1 - \tau) y_{i0} - k_{i0} \exp g \right\} \sum_{t=0}^{\infty} \beta^t + (1 - s_i \theta) g + \frac{s_i}{1 - \beta} \ln \left( \frac{k_{i0}}{k_{i0}} \right) . \tag{24}
\]

We realize that the relationship between individual welfare and growth is not monotonic:

\[
\frac{\partial U_i}{\partial g} \geq 0 \iff g \leq \bar{g}_i \tag{25}
\]

where \(\bar{g}_i = \ln \left\{ \frac{(1 - s_i \theta) (1 - \tau) \beta AZ_{i0}^p}{(1 - s_i \theta) \beta + (1 - \beta) (1 - s_i) k_{i0}^p} \right\} \)

This implies that an increase in growth does not necessarily correspond to an improving in individual welfare. In addition, the positive or negative correlation between individual welfare and growth depends in part on individual status-seeking motive. Actually, as a higher \(\bar{g}_i\) is associated with a stronger \(s_i\), this means that growth rate of the economy has more probability to be lower than \(\bar{g}_i\) if \(s_i\) is strong. Therefore, the higher is \(s_1\) the higher is the probability that agent \(i\)'s welfare is increasing with the growth rate of the economy.

In addition, the threshold of growth above which individual welfare reduces is different between the two types of agents. This means that in the face of a higher growth rate, it is possible that a part of population is happier while another one is less happy. A numerical example is given as below.

**Example:** \(\alpha = 0.6, \beta = 0.8, \tau = 0.3, \theta = 0.8, A = 3, Z_0 = 1, k_{1,0} = 2.5, k_{2,0} = 2, s_1 = 0.5 \) and \(s_2 = 0.4\). These values of parameters give \(\bar{g}_1 = 0.3%\) and \(\bar{g}_2 = 12%\). Therefore, if the growth rate of our economy is in the interval \((0.003, 0.12)\), a higher growth rate will imply a lower welfare for agent 1, and a higher welfare for agent 2.

4 Endogenous fiscal policy

In this section we investigate the implications of status-seeking on endogenous fiscal policy and politico-economic equilibrium growth. We endogenize the fiscal policy by assuming that the tax rate \(\tau_t\) is chosen through a majority voting. As the income tax is financing the public factor of production, individuals face a trade-off. On the one hand, a higher tax rate at period \(t\) lowers current consumption and private investment which becomes future private capital, and then reduces current utility and future output. On the other hand, a higher tax rate at period \(t\) also implies more public investment, which becomes future public capital, and leads to higher future output. The chosen tax rate will balance the losses against the gains.
The optimal tax rate for agent $i$, for $i = 1, 2$, at period $t$ for any $t \geq 0$, is determined by choosing $\tau_t$ to

$$\max_{\tau_t} \left\{ (1-s_i) \ln (c_{it}) + s_i \ln \left( \frac{k_{it}}{k_{it}^\theta} \right) \right\} + \beta \left\{ (1-s_i) \ln (c_{it+1}) + s_i \ln \left( \frac{k_{it+1}}{k_{it+1}^\theta} \right) \right\}$$

$$\begin{aligned}
\tau_t &\in [0, 1], \\
k_t &= \delta k_{1,t} + (1-\delta) k_{2,t}, \\
c_{it} &= \frac{\beta (1-\alpha) (1-\tau_t) AZ_{it}^{0,1-\alpha} c_{it-1}}{k_{it} - \frac{s_{it}\beta}{1-s_i} c_{it-1}} \\
k_{it+1} &= (1-\tau_t) AZ_{it}^{0,1-\alpha} \left( 1 - \frac{\beta (1-\alpha) c_{it-1}}{k_{it} - \frac{s_{it}\beta}{1-s_i} c_{it-1}} \right) \\
Z_{it+1} &= \tau_t AZ_{it}^{0,1-\alpha} \left[ \delta k_{1,t}^{1-\alpha} + (1-\delta) k_{2,t}^{1-\alpha} \right]
\end{aligned}$$

s.t. given $k_0, Z_0$.

Substituting constraints into the value function gives the following program (see Appendix A)

$$\max_{0 \leq \tau_t \leq 1} \alpha \beta (1-s_i) \ln \tau_t + [(1-s_i) (1+\beta - \alpha\beta) + s_i\beta (1-\theta)] \ln (1-\tau_t) + D.$$ 

where $D$ corresponds to other variables and parameters which are independent of $\tau_t$. The optimal tax rate for agent $i$ is given by

$$\tau_{it} = \frac{\alpha \beta (1-s_i)}{1-s_i + \beta (1-s_i) \theta} \equiv \tau(s_i, \theta), \quad (i = 1, 2) \quad (26)$$

Notice that in the case without status consideration, the chosen tax rate is identical for all agents, while it is different between two types of agents when status matters individual welfare. We have $\partial \tau (s_i, \theta) / \partial s_i < 0$. The intuition of this negative effect is as follows. A higher value of $s_i$ corresponds to a higher importance of the agent $i$’s utility from status as compared to her utility from consumption. This implies a stronger incentive to accumulate wealth. Therefore it is to the detriment of consumption and of chosen tax.

However, we have $\partial \tau (s, \theta) / \partial \theta > 0$. This implies that the case where status utility is only determined by absolute wealth (i.e. $\theta = 0$) is the worst situation for providing public expenditure. Intuitively, when $\theta = 0$, status preferences lead each individual to accumulate wealth as high as possible without comparison with others. Therefore, she will vote on the lowest tax rate by keeping the maximum of wealth for herself. On the contrary, when $\theta > 0$, status utility depends on both absolute wealth and relative wealth, i.e. individual compares her wealth level to the average level in the society. She can anticipate that if her wealth is lower due to her choice of a high tax rate, the others’ one is lower too. She feels then less loss of status utility when choosing a high tax rate. This may explain the positive effect of $\theta$ on $\tau (s_i, \theta)$.

Remember that $\delta$ is the size of the group 1, and $1-\delta$ is the size of the group 2 in the economy. Let us assume $\delta < 1/2$. This implies that the voted tax rate of group 2 will overcome that chosen by the group 1. Therefore the tax rate of politico-economic equilibrium is equal
to $\tau(s_2, \theta)$. Substituting $\tau(s_2, \theta)$ into Eq. (19), we can write the political equilibrium growth rate as

$$g = \ln (A\beta^{1-\alpha}) + (1 - \alpha) \ln (1 - \tau(s_2, \theta)) + \alpha \ln \tau(s_2, \theta) + \ln \left[ \delta B_1^{1-\alpha} + (1 - \delta) B_2^{1-\alpha} \right].$$ (27)

Notice that the majoritarian fiscal policy is lower than the growth-maximizing tax rate, which is equal to $\alpha$. The political equilibrium growth is then different than the maximal growth rate. Figure 4 gives a representation of the political equilibrium growth rate as a function of $s_1$ and $s_2$.

![Figure 4](image)

**Figure 4.** Political equilibrium growth as a function of status-seeking motive ($\alpha = 0.6$, $\delta = 0.4$, $\beta = 0.8$, $A = 3$).

The growth impact of status-seeking of group 1 remains positive as it is found under exogenous fiscal policy regime. Group 1's status preference is directed toward a producible asset (i.e. capital wealth). Her wealth accumulation in order to satisfy her desire for social status will keep expanding production and therefore economy will grow. On the contrary, group 2's status-seeking has two opposite effects on growth. On the one hand, a stronger status motive has a negative effect on the chosen tax rate. This reduces public capital and leads to lower output. On the other hand, a stronger status motive has a positive effect on private capital accumulation. This leads to a higher output. Figure 4 shows that when status-seeking motive is sufficiently strong, the negative effect will dominate. This result suggests that a strong status motive might have a negative effect on growth in a democratic economy.

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7 Notice that with endogenous fiscal policy, there are two effects of a higher value of $s$ on private capital accumulation in one period. The direct effect stems from the higher importance of capital accumulation as compared to consumption in the individual quest for happiness. The indirect effect stems from a higher after-tax wealth due to a lower voted tax rate.
5 Concluding remarks

Status-seeking has received an increasing attention from the economic growth literature. Our contribution to this line of research is to investigate wealth distribution, endogenous public policy, as well as political equilibrium growth rate in a two-classes growth model. We have extended the conventional model of Glomm and Ravikumar (1994) by assuming that individuals care about both consumption and social status.

First, it is shown that agents’ preferences for wealth-enhanced social status determine wealth distribution in the long-run: agent with higher status motive will hold a larger share of the total wealth. Second, a higher inequality can be associated with a higher growth if it is due to a stronger incentive to accumulate wealth of one class of agents. These findings suggest that redistributive policy, which aims to restore an egalitarian distribution by taxing agents with higher status motive and subsidizing agent with lower status motive, is not necessarily beneficial in terms of growth. A government intervention regarding individual preferences may be preferable, however this type of intervention is rather complex because it should act to “modify” individual motivation.

The introduction of status preferences implies that a higher growth rate may reduce welfare of one class of agents and raise welfare of other one. Finally, when fiscal policy is determined through a voting mechanism, higher status motive of majoritarian class may reduce political equilibrium growth.

Further studies should use a more general setting than that used in this paper (e.g. logarithmic preferences, Cobb-Douglas production function). In particular, it would be interesting to generalize our model into a framework with non separable utility function (i.e. consumption and status function are not separable), or non-decreasing return to scale production function. For these cases, we have to numerically compute the individuals’ decisions.

6 Appendix A: public policy under majority voting

The preferred public policy is determined by choosing \( \{\tau_t\}_{t=0}^{\infty} \) to

\[
\max_{\{\tau_t\}_{t=0}^{\infty}} \sum_{t=0}^{\infty} \beta^t \left[ (1 - s_i) \ln(c_{it}) + s_i \ln \left( \frac{k_{it}}{k_{it-1}} \right) \right]
\]

subject to

\[
\begin{align*}
\tau_t & \in [0, 1], \\
k_t & = \delta k_{1,t} + (1 - \delta) k_{2,t}, \\
c_{it} & = \beta (1 - \alpha) (1 - \tau_t) AZ_t^\alpha k_{1,t}^{1-\alpha} c_{it-1} \\
& \quad \frac{k_{it} - s_i \beta}{1 - s_i} c_{it-1}
\end{align*}
\]

\[
k_{it+1} = (1 - \tau_t) AZ_t^\alpha k_{1,t}^{1-\alpha} \left( 1 - \frac{\beta (1 - \alpha) c_{it-1}}{k_{it} - s_i \beta c_{it-1}} \right)
\]

\[
Z_{t+1} = \tau_t AZ_t^\alpha \left[ \delta k_{1,t}^{1-\alpha} + (1 - \delta) k_{2,t} \right],
\]

given \( k_0, Z_0 \).
The chosen tax rate in the case without status-seeking is following program

\[
\max_{0 \leq \tau_t \leq 1} \left\{ (1 - s_i) \ln c_{it} (\tau_t) + s_i \ln \frac{k_{it} (\tau_{t-1})}{k_{it}^2 (\tau_{t-1})} \right\} + \beta \left\{ (1 - s_i) \ln c_{it+1} (\tau_{t+1}, \tau_{t+1}) + s_i \ln \frac{k_{it+1} (\tau_t)}{k_{it+1}^2 (\tau_t)} \right\}
\]

\[
k_t = \delta k_{1,t} + (1 - \delta) k_{2,t},
\]

\[
c_{it} = \frac{\beta (1 - \alpha) (1 - \tau_t) AZ_t^\alpha k_{it}^{1-\alpha} c_{it-1}}{k_{it} - \frac{s_i \beta}{1 - s_i} c_{it-1}}
\]

\[
k_{it+1} = (1 - \tau_t) AZ_t^\alpha k_{it}^{1-\alpha} \left( 1 - \frac{\beta (1 - \alpha) c_{it-1}}{k_{it} - \frac{s_i \beta}{1 - s_i} c_{it-1}} \right)
\]

\[
Z_{t+1} = \tau_t AZ_t^\alpha \left[ \delta k_{1,t}^{1-\alpha} + (1 - \delta) k_{2,t}^{1-\alpha} \right],
\]

\[
c_{it+1} = \frac{\beta (1 - \alpha) (1 - \tau_{t+1}) AZ_{t+1}^\alpha k_{it+1}^{1-\alpha} c_{it}}{k_{it+1} - \frac{s_i \beta}{1 - s_i} c_{it}}
\]

given \( k_0, Z_0 \)

Substituting constraints into the value function gives us the equivalent program

\[
\max_{0 \leq \tau_t \leq 1} \alpha \beta (1 - s_i) (1 + \beta - \alpha \beta) + s_i \beta (1 - \theta) \ln (1 - \tau_t) + D_t
\]

where \( D_t \) contains other variables and parameters independent of \( \tau_t \),

\[
D = [(1 - s_i) (1 + \beta - \alpha \beta) + s_i \beta] \ln y_{it} - s_i \theta \beta \ln [y_{1t} (1 - E_1) + y_{2t} (1 - E_2)] +
+ \alpha \beta (1 - s_i) \ln (y_{1t} + y_{2t}) + s_i \ln k_{it} - s_i \theta \ln (k_{it} + k_{2t}) + \beta (1 - s_i) \ln (1 - \tau_{t+1}) +
+ (1 + \beta) (1 - s_i) \ln E_i + \beta (1 - s_i) (1 - \alpha) + s_i \beta \ln (1 - E_i) -
- \beta (1 - s_i) \ln \left( 1 - \left( 1 + \frac{s_i \beta}{1 - s_i} \right) E_i \right) \beta (1 - s_i) \ln \beta (1 - \alpha) A - \beta s_i (1 + \theta) \ln \frac{1}{2}
\]

with \( y_{it} = AZ_t^\alpha k_{it}^{1-\alpha} \).

The first derivative of the value function is given by

\[
\frac{\alpha \beta (1 - s_i) - (1 - s_i) (1 + \beta - \alpha \beta) + s_i \beta (1 - \theta)}{\tau_t}
\]

Then, the preferred tax rate is

\[
\tau_t = \frac{\alpha \beta (1 - s_i)}{1 - s_i + \beta (1 - s_i \theta)} = \tau(s_i, \theta), \text{ for } i = 1, 2.
\]

\[
\frac{\partial \tau_t}{\partial s_i} = -\frac{\alpha \beta (1 - \theta)}{[1 - s_i + \beta (1 - s_i \theta)]^2} < 0,
\]

\[
\frac{\partial \tau_t}{\partial \theta} = \frac{\alpha \beta^2 s_i (1 - s)}{[1 - s_i + \beta (1 - s_i \theta)]^2} > 0.
\]

\[
\frac{\partial^2 \tau_t}{\partial s_i \partial \theta} = \frac{\alpha \beta^2 [1 + \beta + \beta s_i \theta - s_i (1 + 2 \beta)]}{[1 - s_i + \beta (1 - s_i \theta)]^3} < 0 \text{ if } \theta_i < \frac{s_i (1 + 2 \beta) - (1 + \beta)}{\beta s_i}
\]

The chosen tax rate in the case without status-seeking is \( \alpha \beta / (1 + \beta) \), higher than \( \tau(s_i, \theta) \).
References


