Status, endogenous reference standards, and the growth-inequality relation: A note

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Status, endogenous reference standards, and the growth-inequality relation: A note

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Abstract

We develop an endogenous growth model with heterogeneous agents who care about their status in society. Following the social psychology literature, we formalise the idea that the reference standard to which people compare themselves is a choice variable. In such a framework, we analyse the determinants of the choice of the reference standard and their effects on growth and distribution. We show that low skilled individuals can end up with a higher level of income than high skilled individuals if their level of ambition is high enough. This is because what matters for the choice of reference standard and inequality is the combination of skills and ambitions of individuals. Moreover, as skills and ambitions affect positively growth, we find that growth and inequalities can be either negatively or positively correlated.

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Keywords: reference standard, relative position, inequality, growth.

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1   Introduction

The idea that individuals derive utility not only from their level of consumption but also from their relative position in society is by now well established and supported by empirical evidence (Clark and Oswald, 1996; Maurer and Meier, 2008). Among the issues investigated in the literature are the impact of such social comparisons relations on economic growth (Corneo and Jeanne, 1997; Rauscher, 1997; Futagami and Shibata, 1998; Fisher and Hof, 2000; Tournemaine and Tsoukis, 2008a), education (Fershtman, Murphy and Weiss, 1996), fertility (Tournemaine, 2008), and distribution (Pham, 2005; Tsoukis, 2007; Tournemaine and Tsoukis, 2008b, 2008c).

The formalization of individuals' positional concern usually consists of assuming that individuals' social status is determined by their level of wealth, consumption or education relative to a reference standard which is taken to be, for simplicity, the arithmetic average in the economy. There is however no reason to think that the reference standard, or target, to which individuals compare themselves is the average itself or/and that this reference standard is the same for all individuals: different individuals may weigh differently their own and others' performances. This argument finds some support in social psychology where it is argued that individuals play an active role in the choice of their reference standards (see e.g. Diener and Fujita, 1997). As explained in detail by Falk and Knell (2004), individuals face a trade-off between two kinds of goal in choosing their reference standards. First, the goal of "self-enhancement" whereby people prefer to compare themselves to low achievers to get the illusion of a high status, though this is not necessarily the case in reality. Second, the goals of "self-achievement" that can be interpreted as a sign of motivation as individuals seek for high goals and compare themselves with high achievers.

In this paper, we seek to formalise the above ideas in considering that the reference standard to which individuals compare themselves is a choice variable. We have sought to capture the "self-achievement" motive via the inducement to effort that status-seeking generates; this comes from both the status effect on utility and its effect in the disutility of labour (on which more shortly). The "self-enhancement" effect, on the other hand, induces less aspiration the lower down one is in the consumption distribution. Contrary to Falk and Knell (2004) who conduct their theoretical analysis in a static framework, we develop

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an endogenous growth model. To the growing literature on the macroeconomic effects of "keeping up with the Joneses", social comparisons and status, we add three elements: Firstly, the endogenous reference standards and aspirations (see also Tournemaine and Tsoukis, 2008c); we also add the fact that status may affect the disutility of labour, on the basis that "status jobs" induce more work effort among people (Falk and Knell, 2004; Tournemaine and Tsoukis, 2008b). Furthermore, to analyse the determinants of the choice of reference standards and raise the important issue of inequality and growth, we introduce heterogeneity among individuals. While heterogeneity in skills is a standard way to generate income inequality, heterogeneity in the valuation of social comparisons is introduced to capture the idea that individuals may have different levels of ambition (as in Tournemaine and Tsoukis, 2008b). Formally, we assume that heterogeneity stems both from innate skills and the valuation of social comparisons. These are novel elements in the analysis of status, or social comparisons, as is, a fortiori, the combined introduction of all three. The latter two (status-affected effort and idiosyncratic status motivation) are related to the endogenous references standards, or targets, indeed they underpin them in ways that will become clearer below, so that the choice of (endogenous) reference standards is the focal point of the paper. Thus, our contribution in this paper is twofold: first, to introduce endogenous reference standards combined with associated aspects of status; and second, to investigate their effects on growth, distribution, and in particular, on the vexed issue of the relationship between the two.

One would effectively expect that ambitious individuals are more motivated than the ordinary man, set up higher reference standards, and devote more time to working activities to achieve their goals. Therefore, one would conjecture that the valuation of social comparisons affects not only the choice of reference standard (status) but also inequality and long-run growth. The results we get go in this direction. We demonstrate that low skilled individuals can end up with a higher level of income than high skilled individuals if their ambitions are sufficiently high. This is because the crucial factor affecting the choice of reference standard of individuals and the resulting degree of inequality is the relative combination of skills and ambitions. Moreover, as both skills and ambition affect positively growth, we show that growth and inequality can be positively or negatively correlated, a result which fits with the lack of consensus of the literature on this matter.

The remainder of the paper is organised as follows. We present the model in Section

2. We characterise the equilibrium and examine its key properties in Section 3 and 4, respectvely. We conclude in Section 5.

2 Model

We consider a closed economy where time is continuous and denoted by $t: t \in [0, \infty)$. There is a mass $[0, 1]$ of infinitely-lived individuals divided into two groups of identical individuals denoted by i, $i = 1, 2$. Group 1 has size β and group 2 has size $1 - \beta$. Each individual is initially endowed with $k_{i0} > 0$ units of capital (wealth) at date zero and T units of labour-time. She produces an output, y_{it}, which can be consumed, c_{it}, or invested to give new units of capital, k_{it}. Assuming that each unit of output devoted to investments yields one new unit of capital, we have:

$$y_{it} = c_{it} + \dot{k}_{it}. \tag{1}$$

Following Romer (1986), the technology for output is given by

$$y_{it} = A_i (k_{it})^\alpha (k_t l_{it})^{1-\alpha}, \tag{2}$$

where $0 < \alpha < 1$, $A_i > 0$ is a time-invariant productivity parameter specific to individuals of group i, l_{it} is the amount of time devoted to the production of output and $k_t \equiv (k_{1t})^\beta (k_{2t})^{(1-\beta)}$ is the geometric average stock of capital (learning by investing). Technology (2) captures the idea that individuals benefit from a different level of technology or have different innate skills, A_i. Without loss of generality, we assume that $A_1 \geq A_2$.

Individuals derive utility from their level of consumption and social comparison. They incur disutility through working time spent in the production of output. Social comparisons are made via the ratio of the level of consumption, c_{it}, to a specific reference standard, $\overline{c_{it}}$, given by:

$$\overline{c_{it}} = \gamma_{it} \overline{c_t}, \tag{3}$$

where $\overline{c_t} = (c_{1t})^\beta (c_{2t})^{(1-\beta)}$ is the geometric average level of consumption and $\gamma_{it} > 0$ is a strictly positive scalar. In the specification of the reference standard (3), the novelty is twofold. First, as mentioned, one key aspect of social comparison is that the reference

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standard to which individuals compare themselves is not necessarily given by the average level of consumption in the economy: in contrast with the standard literature, γ_{it} is not necessarily set equal to one. Second, this reference standard is actively chosen by individuals as γ_{it} is a choice variable. The reference standard (3), though endogenous, depends on the average level of consumption, that is on people's overall performances. Thereby, parameter γ_{it} regulates the importance of this average for social comparisons. Formally, a low value of γ_{it} means that individuals choose a low reference standard which may give them the feeling of a high status. In contrast, a high value of γ_{it} reduces the perception of status by individuals which can be seen as a sign of a high motivation.

Preferences of individual i are represented by

$$U_i = \int\limits_0^\infty \left[\ln c_{it} + \eta_i \Psi(c_{it}/\overline{c_{it}}) - \delta\left(l_{it}\right) \Psi(c_{it}/\overline{c_{it}}) \right] e^{-\rho t} dt, \tag{4}$$

where $\rho > 0$ is the rate of time preference, $\delta > 0$ is a parameter accounting for the marginal disutility of work, $\Psi\left(\bullet\right),$ which is strictly increasing and concave, is the social comparison function and η_i is an agent-specific preference parameter measuring individuals' idiosyncratic attitude to status motivation or social comparison, with $0 < \eta_i < \delta T$ to ensure the existence of an interior solution in the steady state. Accordingly, as mentioned, heterogeneity stems from the idiosyncratic status-related motivation as well idiosyncratic innate productivity. As will be seen, $\overline{c_{it}}$ is positively related to η_i. Ceteris paribus η_i can be interpreted as a proxy for individuals' ambition.

As mentioned, the reference standard, $\overline{c_{it}}$, is chosen so as to accomplish the goals of "self-enhancement" and "self-improvement". The utility function (4) captures this feature in that $\overline{c_{it}}$, has both negative and positive effects. While the negative effect manifests itself in a standard way through the reduction of status' perception, the positive effect manifests itself through the reduction of the disutility of work as suggested by Falk and Knell (2004), Tournemaine and Tsoukis (2008b): high goals give more motivation to individuals who then can feel less tired to work.

The fact that the function $\Psi(c_{it}/\overline{c_{it}})$ is used to account for both the positive and negative effects of the reference standard must be seen as a way to simplify computations and get solutions that can easily be interpreted. To further simplify the analysis, we follow

Corneo and Jeanne (1997), Futagami and Shibata (1998) and set:

$$\Psi\left(\frac{c_{it}}{\overline{c_{it}}}\right) = \left(\frac{c_{it}}{\overline{c_{it}}}\right)^{\phi}, \tag{5}$$

where $0 < \phi \leq 1$.

3   Equilibrium

Each individual chooses consumption, labor, reference standard and wealth to maximize (4) subject to (1) and (2). In solving this problem, we assume that individuals take the consumption levels c_{1t} and c_{2t} as given: $\partial \overline{c_{it}}/\partial c_{it} = 0$, for $i = 1, 2$. That is, we consider that individuals are so small that the change of consumption of any of them does not affect the reference standard chosen by individual i.

After manipulation, the current-value Hamiltonian of this problem for individual i is $CVH = \ln c_{it} + \eta_i(c_{it}/\overline{c_{it}})^{\phi} - \delta(l_{it})(c_{it}/\overline{c_{it}})^{\phi} + \lambda_{it}[A_i(k_{it})^{\alpha}(k_t l_{it})^{1-\alpha} - c_{it}]$, where λ_{it} is the co-state variable associated with (1). The first order conditions are $\partial CVH/\partial c_{it} = 0$, $\partial CVH/\partial l_{it} = 0$, $\partial CVH/\partial \gamma_{it} = 0$ and $\partial CVH/\partial k_{it} = -\overset{\bullet}{\lambda_{it}} + \lambda_{it}\rho$. The transversality condition is $\lim_{t\to\infty} \lambda_{it} k_{it} e^{-\rho t} = 0$. Rearranging the first order conditions, we get:

$$\frac{1}{c_{it}}\left[1 + \phi(\eta_i - \delta l_{it})\left(\frac{c_{it}}{\overline{c_{it}}}\right)^{\phi}\right] = \lambda_{it}, \tag{6}$$

$$\delta l_{it} = \eta_i, \tag{7}$$

$$\frac{(1-\alpha)y_{it}}{l_{it}c_{it}} = \delta\left(\frac{c_{it}}{\overline{c_{it}}}\right)^{\phi}, \tag{8}$$

$$\frac{\alpha y_{it}}{k_{it}} + \frac{\overset{\bullet}{\lambda_{it}}}{\lambda_{it}} = \rho. \tag{9}$$

In the rest of the paper we restrict attention to the steady-state. In this case the growth rate of variables must be common across agents otherwise someone would end up owning the whole of the economy asymptotically (see e.g. Barro and Sala-i-Martin, 2004, ch. 3). As a result, all the key ratios, like relative consumption between groups, consumption-to-capital, output-to-capital, as well as the labour supply and the weights individuals put on average consumption to determine the reference standards are all constant. Time subscripts are dropped when quantities are constant, but kept for perpetually growing

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variables. We denote by g the common growth rate of capital, consumption and output. Simple manipulation of (1)-(9) allows us to characterise the steady-state equilibrium. Results are summarised in Proposition 1. Their analysis is gathered in Section 4.

Proposition 1 *The amount of labour, l_i, allocated to output production is given by:*

$$l_i = \frac{\eta_i}{\delta}. \tag{10}$$

Individual's i social status is given by:

$$\frac{c_{it}}{\overline{c}_{it}} = \left\{ \frac{(1-\alpha)(g+\rho)}{\eta_i[(1-\alpha)g+\rho]} \right\}^{1/\phi}. \tag{11}$$

The common rate of growth, g, and the relative amounts of capital, consumption and income, k_{1t}/k_{2t}, c_{1t}/c_{2t}, y_{1t}/y_{2t}, verify:

$$g = \frac{\alpha (A_1)^{\beta} (A_2)^{(1-\beta)} (\eta_1)^{(1-\alpha)\beta} (\eta_2)^{(1-\alpha)(1-\beta)}}{\delta^{1-\alpha}} - \rho, \tag{12}$$

$$\frac{k_{1t}}{k_{2t}} = \frac{c_{1t}}{c_{2t}} = \frac{y_{1t}}{y_{2t}} = \frac{\eta_1}{\eta_2} \left(\frac{A_1}{A_2} \right)^{\frac{1}{1-\alpha}}. \tag{13}$$

The weights, γ_1, γ_2, chosen by individuals are given by:

$$\gamma_1 = \left(\frac{c_{1t}}{c_{2t}} \right)^{(1-\beta)} \left\{ \frac{\eta_1[(1-\alpha)g+\rho]}{(1-\alpha)(g+\rho)} \right\}^{1/\phi}. \tag{14}$$

$$\gamma_2 = \left(\frac{c_{1t}}{c_{2t}} \right)^{-\beta} \left\{ \frac{\eta_2[(1-\alpha)g+\rho]}{(1-\alpha)(g+\rho)} \right\}^{1/\phi}. \tag{15}$$

Proof. *Labour supply follows directly from (7). Combining (1), (2), (8), (9) and (10) yields (11). Combining (1), (2) and (9) leads to equations (12) and (13). Using (3), (11) and (13), we get (14) and (15).* ∎

4 Choice of reference standard, inequality and growth

4.1 Steady-state under symmetry

Before turning to the examination of the model under heterogeneity, it is instructive to look at the outcomes under the simplifying assumption of symmetry. When $A_1 =$

$A_2 = A$ and $\eta_1 = \eta_2 = \eta$, individuals share both the same technology and valuation of social comparison. Thereby, individuals have the same ability and willingness to produce, to consume and to save. Moreover, as the sources of heterogeneity have vanished, the reference standard to which individuals compare themselves turns out to be the same. Though, equations (14) and (15) show that in general individuals do not set the average level of consumption as a reference standard: $\gamma_1 = \gamma_2 = \gamma$ can be greater or lower than one. Whether $\gamma > 1$ or $\gamma < 1$ depends on individuals' characteristics. We have:

Proposition 2 *Higher values of the social comparison parameter, η, rate of time preferences, ρ, and marginal disutility of working, δ, favour upward comparisons while a higher level of skills, A, is likely to favour downward comparisons.*

The fact that people have mainly upward comparisons was suggested years ago by Duesenberry (1949) and confirmed empirically by Bowles and Park (2005). This paper, then, provides a possible explanation for this fact. Whether social comparisons are made in an upward or downward manner depends on the balance between the goals of "self enhancement" and "self achievement", i.e. on how individuals' characteristics affect the balance between these two kinds of goals.

Intuitively, as a higher value of η means a greater level of ambition, individuals set up higher reference standards: a greater motivation to work turns the trade-off between the goals of "self enhancement" and "self achievement" towards the "self achievement" ones. In the case of a greater rate of time preferences, ρ, individuals become more impatient. They incur a reduction in the subjective valuation of the utility derived in the future relative to the valuation of the current utility. Hence, we would expect individuals to spend more resources on fulfilling current needs, whereby individuals reduce their savings to increase their present consumption. This in turn leads to an increase of their reference standards. As regards to a higher marginal disutility of work, δ, the reason is simply that individuals are more willing to set up higher reference standards in order to reduce their disutility from working. Finally, a higher level of skills, A, allows individuals to perform better in that they achieve higher levels of income, capital and consumption. Ceteris paribus, this means that individuals choose easier goals relative to their abilities.

4.2 Steady-state under heterogeneity

We now analyse the steady-state under heterogeneity in skills and valuation of social comparisons (i.e. ambition). The crucial question here is whether the original skills inequality is amplified or attenuated by individuals' level of ambition and how the combination of these two sources of heterogeneity are transmitted to economic growth.

Figure 1 represents the set of possible outcomes of our model for the choice of reference standard and the relative level of consumption of individuals as a function of η_2 for given values of A_1, A_2, η_1 and under the assumption $A_1 > A_2$.

Insert Figure 1 Here

From Figure 1, three kinds of outcomes are possible. First, if $\eta_2 < \eta_1 \left(A_1/A_2\right)^{\frac{\phi}{(1-\alpha)(1+\phi)}}$, individuals of group 1 set up higher reference standards and end up with a higher level of capital, consumption and income than individuals of group 2. Note that if $\eta_2 < \eta_1$ individuals of group 2 have the feeling that they achieve a higher status than individuals of group 2: $c_{1t}/\overline{c_{1t}} < c_{2t}/\overline{c_{2t}}$ (see equation (11)), whereby we may argue that for individuals of group 2 "[b]etter be first in a village than second in a town". The reason is that the trade-off between the goals of "self enhancement" and "self achievement" turns out towards the "self achievement" ones for individuals of group 1 and towards the "self enhancement" ones for individuals of group 2. While individuals of group 1 reduce their disutility from work through high consumption targets, individuals of group 2 prefer to derive utility from the feeling of a high status. If, however, individuals of group 2 are more ambitious ($\eta_2 > \eta_1$) the above trade-offs are reversed and it results a higher status for individuals of group 1: $c_{1t}/\overline{c_{1t}} > c_{2t}/\overline{c_{2t}}$.

Second, if $\eta_2 \in [\eta_1 \left(A_1/A_2\right)^{\frac{\phi}{(1-\alpha)(1+\phi)}} ; \eta_1 \left(A_1/A_2\right)^{\frac{1}{(1-\alpha)}}]$, individuals of group 2 set up higher reference standards than those chosen by individuals of group 1 ($\gamma_2 > \gamma_1$). This dampens inequalities due to innate skills: individuals of group 2 compensate partially their lack of productivity ($A_1 > A_2$) through a greater amount of hours worked: $l_2 > l_1$. Finally, if $\eta_2 > \eta_1 \left(A_1/A_2\right)^{\frac{1}{(1-\alpha)}}$, the level of ambition of individuals of group 2 is high enough to reverse the gap of inequalities initially due to innate skills.

Gathering the above results we can now establish the property of the model regarding growth and inequality. Since growth rises unambiguously with average skills,

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$(A_1)^{\beta}(A_2)^{(1-\beta)}$, and average valuation of social comparison, $(\eta_1)^{\beta}(\eta_2)^{(1-\beta)}$ (see equation (12)), we have:

Proposition 3 *Growth and inequality can be negatively or positively correlated.*

The noteworthy feature about Proposition 3 is that its result fits with the lack of consensus found in the literature. For instance, Persson and Tabellini (1994) present cross-country evidence of a negative effect of inequality on growth. In contrast, Partridge (1997) concludes that greater inequality is associated with greater growth. Other studies, finally, argue that changes in income and changes in inequality are unrelated (Deninger and Squire, 1996; Chen and Ravallion, 1997).

Thus, in addition to reconciling these views, the present framework provides a more balanced perspective which relies on a simple argument. The relationship between growth and inequality is ambiguous because capital accumulation which gives the pace of economic growth depends on the absolute levels of skills and ambition of people (skills affecting directly production of output and social comparison acting indirectly through labour supply), whereas the degree of inequality between individuals is the outcome of the relative combination of these two factors. That is, whether inequality is greater or lower due to changes in relative skills or/and ambition of individuals, the effects on economic growth are always positive.

5   Conclusion

We have developed a simple growth model with heterogeneous individuals who care about social comparisons. The core contribution is that social comparisons are made in an endogenous manner as individuals choose the reference standards to which they compare themselves. We have highlighted the effects of heterogeneity from skills and valuation of social comparison (ambition) on the choice of reference standard, inequality and growth. In doing so, we have pointed out the ways by which these interrelated concepts impinge on macroeconomic outcomes.

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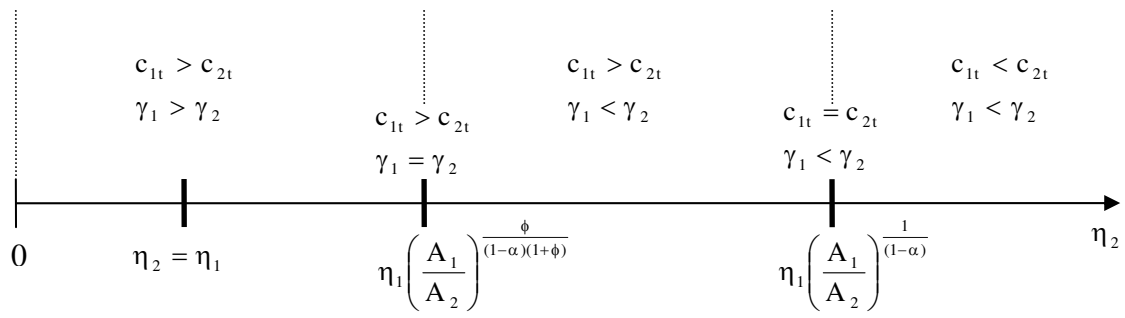Tsoukis C. (2007) Keeping up with the Joneses, Growth, and Distribution. *Scottish Journal of Political Economy,* 54, pp. 575-600.

Figure 1 : Inequality and choice of reference standard

The number line from left to right shows:

- 0
- $\eta_2 = \eta_1$
- $\eta_1\left(\dfrac{A_1}{A_2}\right)^{\frac{\phi}{(1-\alpha)(1+\phi)}}$
- $\eta_1\left(\dfrac{A_1}{A_2}\right)^{\frac{1}{(1-\alpha)}}$
- axis labeled η_2

Region labels:

- $c_{1t} > c_{2t}$, $\gamma_1 > \gamma_2$
- $c_{1t} > c_{2t}$, $\gamma_1 = \gamma_2$
- $c_{1t} > c_{2t}$, $\gamma_1 < \gamma_2$
- $c_{1t} = c_{2t}$, $\gamma_1 < \gamma_2$
- $c_{1t} < c_{2t}$, $\gamma_1 < \gamma_2$