Endogenous Aspirations and Economic Growth

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The various "theories of endogenous growth" that were elaborated over the last fifteen years have considered some indisputable "engines of growth," such as product and process innovation, market structure, human capital, and public infrastructure. This note submits that economic growth might depend also on somewhat less tangible socio-economic and psychological factors such as the way the "aspirations" of economic agents, which influence their intertemporal consumption, evolve over time. It is shown that capital accumulation can be sustained in a standard endogenous growth setting where aspirations are exogenous and constant, while *it may not* if aspirations can instead change with the per capita stock of physical and human capital.

Keywords: Endogenous preferences; endogenous growth / A-K models.

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1. Introduction

The last decade has seen significant progress being made in understanding the mechanics and underlying microeconomics of economic growth. The impulse came from a viewpoint increasingly shared among economists, that one should see economic growth as "an *endogenous* outcome of the economic forces at work within a decentralized market system rather than the product of technological innovations over which the market has no control." [Ehrlich (1990), p. S3] Thanks to some timely analytical tools which allowed to promote this approach,[1] the relationships between key features of economic growth such as nondecreasing returns or creative destruction and apprehended "engines of growth" such as product and process innovation, market structure, human capital, and public infrastructure have now been largely explored and articulated.[2]

Only recently, however, have economists begun to rigorously address the social and psychological factors that determine the dynamic preferences of economic agents, hence their intertemporal consumption decisions and the consequent growth path.[3] Along this line of research, this note now proposes a simple model which captures the effect of such

[1] For a compelling assessment of the importance that such tools be available to make new economic ideas accepted and developed, see Krugman (1995).

[2] The theory of endogenous growth builds on the respective seminal contributions of Romer (1986, 1990), Lucas (1988), and Aghion and Howitt (1992). For an excellent introduction to the abundant literature these papers have generated, see Barro and Sala-i-Martin (1995) or Aghion and Howitt (1998).

[3] See, for instance, Ray (2002). (My notion of aspirations is not the one he discusses, however.) A few authors did of course study early on the impact of endogenous subjective factors on economic growth. In their work on development and fertility, for instance, Barro and Becker (1989) and Becker, Murphy and Tamura (1990) posit that the more fertile the present generation the higher its *discount rate* on per capita future consumption.

factors. Suppose that growth is governed by the intertemporal decisions of a representative agent whose preferences for consumption depend on his aspirations. The latter notion can be formalized as follows: someone has higher (lower) aspirations when he always exhibits higher (lower) marginal utility for consumption but also experiences lower (higher) utility at low consumption levels. In a manner that recalls the literature on habit formation [see Boyer (1983), for instance], allow the current stock of physical and human capital to determine the agent's aspirations at any given time. Then, within a standard endogenous growth model one can highlight the influence on growth of the specific linkage between aspirations and capital levels: for example, economic growth is sustainable under unchanging aspirations, but *it may not be* when aspirations increase rapidly with physical and human capital.

The following section presents the formal notions of aspirations and of aspirations formation. A standard capital accumulation constraint, the so-called "A-K model," is introduced in section 3. Intertemporal consumption decisions and their corresponding growth paths are considered in section 4. Section 5 finally shows how the aspirations formation process matters for capital expansion and economic growth. Section 6 contains some concluding remarks.

2. A Representation of Aspirations and Aspirations Formation

Introspectively, low aspirations can be associated with the so-called "culture of poverty" [as defined, for instance, in Kemper (1990)]: someone would have low aspirations when he accommodates to low power and low social status.

Taking individual consumption as a proxy for power and status, I shall then interpret the word "accommodate" as follows: someone has lower (higher) aspirations when his marginal utility for consumption is relatively lower (higher) but his utility at small consumption levels is relatively higher (lower). The following figure illustrates this definition.

In this paper aspirations will be assumed to increase with the per capita stock k of human and physical capital. Formally, let the representative agent's utility at consumption level c be given by

$$a(k)V(c) + b(k). \tag{1}$$

The function $V(\cdot)$ is the standard CES (Constant intertemporal Elasticity of Substitution) utility function, defined as $V(c) = \frac{c^{1-\sigma}}{1-\sigma}$, which is commonly used in economic growth modelling. The pair $\{a(\cdot), b(\cdot)\}$ represents an aspirations formation process. The function $a(\cdot)$ influences marginal utility and has a nonnegative first derivative $a'(\cdot) \geq 0$; the function $b(\cdot)$ determines the representative agent's utility when c is small, so $b'(\cdot) \leq 0$.

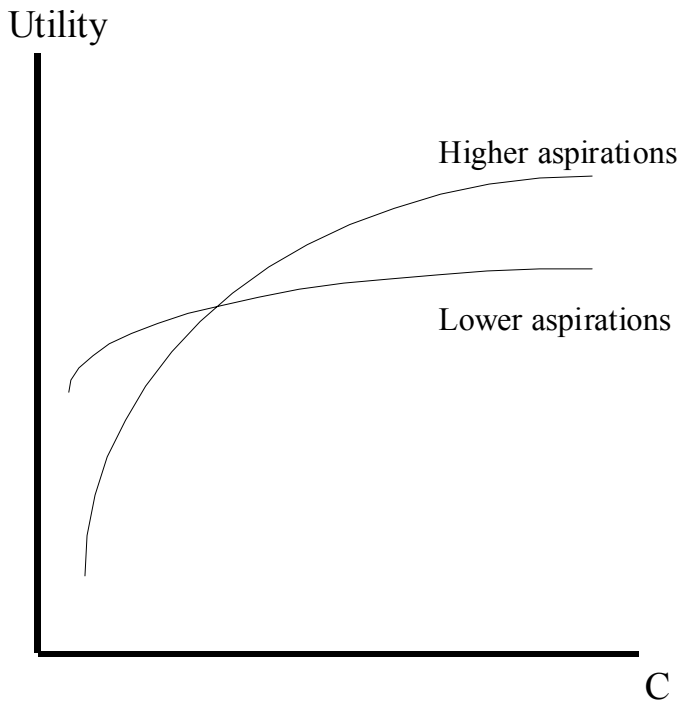

Figure 2.1: Higher and lower aspirations

3. The Capital Accumulation Process

One main finding of the endogenous growth literature is that, in order to have a positive steady-state growth rate, there must be constant returns to the factors that can be accumulated. Without loss of generality, dynamic capital accumulation can thus be described by the following first-order linear differential equation (where t stands for time)

$$\dot{k}(t) = Ak(t) - c(t). \tag{2}$$

This is the so-called well-known "A-K model." As shown in Rebelo (1991) and Barro and Sala-i-Martin (1995), much of the endogenous growth literature can actually be seen as seeking to spell out the microeconomics underlying the coefficient A.

Equation (2) means in fact that there are no fixed production factor. This is indeed a rather favorable context for capital expansion. Any dampening of economic growth will now have to be attributed only to aspirations.[4]

4. Rational Growth Paths

Rational growth paths are determined by the representative agent's maximizing his discounted utility (1) subject to the capital accumulation constraint (2). That is,

[4]For simplicity, and in order to stress the effect of endogenous aspirations, it is assumed throughout that the population growth rate is 0. The central message of this paper would still hold, of course, it it were positive.

$$\max_{c(t)} \int_0^\infty e^{-\rho t}[a(k(t))V(c(t)) + b(k(t))]dt$$

subject to:

$$\dot{k}(t) = Ak(t) - c(t)$$

$$k(0) = k_0$$

$$c(t)\ ,\ k(t) \geq 0\ \ .$$

The Hamiltonian associated with this optimal control problem (omitting the time arguments of $k(t)$, $c(t)$ and the Lagrange multiplier $\mu(t)$) is

$$H(k, c, \mu; t) = e^{-\rho t}[a(k)V(c) + b(k)] + \mu[Ak - c]. \tag{3}$$

By the maximum principle, the first-order necessary conditions for a solution to the above problem are then

$$e^{-\rho t}a(k)V'(c) = \mu \tag{4}$$

$$-e^{-\rho t}[a'(k)V(c) + b'(k)] - \mu A = \dot{\mu} \tag{5}$$

$$\lim_{t\to\infty}\ k(t)\mu(t) = 0. \tag{6}$$

Replacing the function $V(c) = \frac{c^{1-\sigma}}{1-\sigma}$ in (4) and (5), taking logs and time derivatives of the obtained expression for (4), replacing $\frac{\dot{\mu}}{\mu}$ and μ in (5), doing then some straightforward algebra and using (2), one finally gets the following differential equation

$$\dot{c} = \frac{c}{\sigma}[(A-\rho) + \frac{a'}{a}(\frac{\sigma c}{1-\sigma} + Ak) + \frac{b'}{a}c^{\sigma}] \tag{7}$$

which, together with equation (2), describes the rational growth paths.

5. Aspirations Matter

Suppose now that the economy has reached a balanced growth path where the steady-state growth rate of per capita human and physical capital $\frac{\dot{k}}{k}$ is equal to a constant τ. By the capital accumulation constraint (2),

$$\tau = \frac{\dot{k}}{k} = A - \frac{c}{k} \quad . \tag{8}$$

Taking logs and time derivatives of (8), one has that

$$\frac{\dot{k}}{k} = \tau = \frac{\dot{c}}{c} \quad . \tag{9}$$

Hence, per capita capital and consumption must grow at the same rate τ.

Now, substitute τ in equation (7). Rearranging the terms yields

$$\sigma\tau + \rho = A + \frac{a'}{a}k\tau + \frac{a'}{a}\frac{c}{1-\sigma} + \frac{b'}{a}c^{\sigma}. \tag{10}$$

The latter reveals that the aspirations formation process represented by $a'(k) = b'(k) = 0$, which is implicit throughout the endogenous growth literature, is of course compatible

with a positive steady-state growth rate τ. However, a process $\{a(\cdot), b(\cdot)\}$ where, for instance, $a(k) = e^{\alpha k}$ and $b(k) = -e^{\beta k}$ for some positive real numbers α and β, might give anything but $\tau > 0$!

6. Concluding Remarks

"We manage our preferences. We select actions now partly in terms of expectations about the effect of those actions on future preferences. We do things now to modify our future tastes." [March (1978), pp.596] Analyses and models of long-term economic growth should now take this fact into account. This note illustrated one way to go, which is to directly address the way the intertemporal preferences of a representative agent are set.

One further step would be to develop a less aggregate model of capital accumulation and aspirations formation. To be sure, different types of human and physical capital should have different effects on aspirations. For instance, one main assertion of the so-called "dependency approach" to development [see, e.g., Evans and Stephens (1988)] is that some imported types of human capital can in fact generate consumption habits that hinder economic growth.

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