

Entrepreneurial Status, Social Norms, and Economic Growth



Dimitrios Varvarigos, University of Leicester
Nikolaos Kontogiannis, University of Leicester

Entrepreneurial Status, Social Norms, and Economic Growth*

Dimitrios Varvarigos[‡]
University of Leicester

Nikolaos Kontogiannis
University of Leicester

Abstract

We offer a behavioural approach on the relation between growth and volatility, based on a monetary growth model where entrepreneurs borrow funds to invest in projects that produce capital goods. In addition to their varying pecuniary returns, different projects also vary with respect to the status they confer to the entrepreneurs who operate them. We show that social status promotes capital accumulation. We also show that, even when the status-induced increase of marginal utility is constant over time, the interaction between status and inflation is an additional source of transitional dynamics. When a social norm links this increase of marginal utility to past outcomes, however, the dynamics can generate endogenous cycles in the transition to the balanced growth path.

Keywords: Social status; Norms; Economic growth; Cycles

JEL Classification: E32; O42; Z10

* We would like to thank Aris Boukouras for useful comments and suggestions. The work on this paper is based on Chapter 4 of Nikolaos Kontogiannis' PhD thesis "A Study in Optimal Monetary Policy, Inflation and Capital Accumulation" (University of Leicester). Nikolaos Kontogiannis acknowledges financial support from the State Scholarships Foundation of Greece (IKY). The usual disclaimer applies.

[‡] School of Business – Division of Economics, University of Leicester, University Road, Leicester LE1 7RH, United Kingdom.

✉ dv33@le.ac.uk

☎ +44 (0) 116 252 2184

1 Introduction

The role of social status on decision making has long been recognised as an important determinant of economic outcomes (Weiss and Fershtman 1998; Heffetz and Frank 2011). From a macroeconomic perspective, economists have investigated the effects of status on economic growth and social welfare by means of frameworks in which status concerns are associated with either a desire for high relative wealth *per se*¹, or conspicuous/positional consumption², or both (e.g., Zou 1994; Bakshi and Chen 1996; Corneo and Jeanne 1997, 2001; Rauscher 1997; Futagami and Shibata 1998; Tournemaine and Tsoukis 2008; Wendner 2010; Varvarigos 2011). These effects have been shown to be ambiguous and to depend on various characteristics, such as the underlying source of social status. A similar ambiguity applies to the analysis of Fershtman *et al.* (1996). They employ a model with costly occupational choice where higher status is attached to the growth-enhancing occupation. Their results indicate that, in addition to its direct positive effect on growth, social status may also be a source of negative growth effects due to the fact that it attracts wealthy, but low-ability, individuals to the growth-enhancing occupation, hence reducing its average quality.

This paper is an attempt to take explicit account of status concerns that originate from entrepreneurial decisions, and present their implications for both transitional dynamics and long-term growth. The motivation behind our analysis is the view that entrepreneurship is yet another area of economic activity for which social status seems to be pertinent. Indeed, many analyses confirm the view that social status, and the characteristics that confer it, such as prestige, recognition, approval, and a sense of achievement, are important elements of entrepreneurial aspirations, decisions, and performance (e.g., Scheinberg and MacMillan 1988; Shane *et al.* 1991; Collins *et al.* 2004; Malach-Pines *et al.* 2005; Van Praag 2011). In a similar vein, some researchers (e.g., Hollingshead 1975) have argued that the scale of entrepreneurial activities – typically measured by the monetary value of firms – increases the status conferred to their proprietors.

¹ This idea follows Weber's (1904) notion of the 'spirit of capitalism'.

² See Veblen (1899) and Hirsch (1976).

In our model, entrepreneurs are individuals who borrow funds in order to operate projects that produce capital goods. In addition to their varying pecuniary returns, different projects also vary with respect to the status they confer to the entrepreneurs who operate them – an idea that is conceptually similar to the occupation-induced status of Fershtman *et al.* (1996). The model is a monetary one in the sense that there is a demand for money by lenders who face a liquidity constraint in their role as loan providers.³ We show that, in addition to their effect on the economy's long-run growth rate, which is positive, status concerns have important implications for the shape of the economy's dynamics towards the balanced growth path. In fact, despite the presence of a production technology with permanently constant (social) returns to capital, the existence of status concerns generates transitional dynamics that do not allow an instantaneous adjustment to the balanced growth path. This occurs even when the status-induced increase of marginal utility is constant over time because, by increasing the growth rate and reducing the rate of inflation, the number of entrepreneurs who invested in the high-return/high-status project in the past has a positive effect on the incentive of the next generation's entrepreneurs to act similarly. The dynamics differ, however, under a social norm whereby status concerns are linked to past outcomes – specifically, when the status-induced increase of marginal utility is less pronounced in economies where the involvement with the high-return project was more common among entrepreneurs historically. Under this scenario, and in addition to sustaining a lower growth rate in the long-run, the economy's transitional dynamics can generate cycles endogenously, as it converges to its balanced growth path.⁴

Given that the characteristics of social status have implications for the shape of economic dynamics (monotonic or cyclical) and long-term economic performance (the growth rate), we also use the model's implications to provide a novel explanation for the relation between cyclical fluctuations and growth. This issue relates to empirical analyses that have shown a significant relation between the average growth rate and its

³ Other monetary models that include elements relevant to social status are those by Chang *et al.* (2000) and Gong and Zou (2001). These analyses show that, under the 'spirit of capitalism' assumption, inflation has real effects in circumstances where money would otherwise be neutral.

⁴ Azariadis and Smith (1996) analyse a monetary growth model that generates damped fluctuations in the transition to the steady state. In their framework, the underlying cause of such cycles is the presence of credit market imperfections. In our model, we do not consider such imperfections; damped fluctuations are attributed solely to status concerns and the social norm that fuels them.

volatility (e.g., Ramey and Ramey 1995; Martin and Rogers 2000; Koren and Tenreyro 2007). From a theoretical perspective, the more common approach in examining the underlying characteristics of this relation has been the construction of stochastic endogenous growth models in which the cycles generated by stochastic shocks impinge on the long-run growth rate (e.g., Femminis 2001; Canton 2002; Varvarigos 2010). Our approach in inferring a relation between cyclical fluctuations and growth is rather different, being rooted on behavioural characteristics. Specifically, our argument is that the driving forces behind status considerations and social norms are (partially) responsible for the long-term prospects of the economy, and for the shape of its dynamics. In other words, the correlation between growth and cycles reflects the idea that cyclical growth converges to a lower value in the long-run, compared with a growth rate that is smoother (i.e., monotonic) during the transition.

The rest of the paper is organized as follows: In Section 2, we present the economic environment and derive the economy's equilibrium. In Section 3, we analyse the effects of social status, and its underlying characteristics, on the economy's dynamics and the (long-run) growth rate. Section 4 summarises and discusses some policy implications.

2 The Economy

Consider an economy populated by overlapping generations of individuals who live for three periods. The population mass of each age cohort is constant over time and equal to $2n$ ($n > 0$). Following their birth, nature divides individuals into two equal-sized groups of varying characteristics. Particularly, half of these individuals will spend their lifetimes as workers; the rest of them will spend their lifetimes as entrepreneurs. Irrespective of their type, all individuals are risk-neutral and enjoy utility from the consumption of goods during the last period of their lifetime.

Consider a worker born in period t . During the first period of her lifetime she is endowed with one unit of labour which she (inelastically) supplies to firms that produce the economy's final good. In exchange, she receives the competitive salary w_t . Subsequently, she explores opportunities for saving her income until the third period of her lifetime, during which she will receive the proceeds of her savings and use them to purchase consumption goods. One such opportunity is a storage technology that returns

$1+q$ ($q \geq 0$) units of output in period $t+2$ for each unit of output stored in period t . Alternatively, she can agree to offer a loan to an entrepreneur, in a manner that will be described shortly.

Now let us consider an entrepreneur born in period t . She is largely inactive during the first period of her lifetime. In the second period, however, she is endowed with the ability to operate an investment project that generates $\Phi(j) > 0$ ($j = \{H, L\}$) units of capital in period $t+2$ for each unit of output invested in period $t+1$. The entrepreneur will sell this capital to firms at a competitive price $r > 0$ per unit.⁵ There are two such projects at her disposal, but she can choose to operate only one of them – a decision that, once made, is irreversible. The H project returns $\Phi(H) = \varphi$ units of capital for each unit of investment. In addition to its cost in terms of output, this project entails an effort cost for the entrepreneur. We assume that this effort cost is proportional to the scale of the project as it requires B units of effort per unit of output invested in it. We also assume that B is uniformly distributed across entrepreneurs, with support on $[0, n]$. The L project, on the other hand, does not entail such an effort cost. Nevertheless, it offers a lower return of $\Phi(L) = (1-\psi)\varphi$ units of capital ($0 < \psi < 1$) for each unit of output invested in it. Note that, given the lack of own sources of income, entrepreneurs have no other option other than to borrow funds from workers in order to operate any of these two projects. Once an entrepreneur repays the loan in period $t+2$, she will use the residual income to purchase consumption goods.

The economy's final good can be used for both consumption and investment purposes. It is produced by a unit mass of perfectly competitive firms who combine labour from workers, denoted N_t , and capital purchased by entrepreneurs, denoted K_t , in order to produce Y_t units of output according to the following technology:

$$Y_t = AK_t^a (\Gamma_t N_t)^{1-a}, \quad a \in (0, 1), \quad (1)$$

Following Romer (1986), the variable Γ_t captures the productivity benefits that accrue as a result of an economy-wide, learning-by-doing externality that is related to the stock of capital per worker according to⁶

⁵ Capital is assumed to depreciate completely during the production process.

⁶ This externality is introduced as a means of allowing the emergence of an equilibrium with positive long-run growth.

$$\Gamma_t = \frac{K_t}{n}. \quad (2)$$

2.1 Occupational Choice and Social Status

The differences between the two projects are not restricted to their varying (pecuniary) returns in terms of investment. On the contrary, we envisage a scenario where the choice of investment project generates direct utility effects that accrue to the entrepreneur who is involved in its operation. Such non-pecuniary differences are justified by alluding to the idea that an entrepreneur's occupational choice will have a direct impact on her utility due to social status concerns.

Recalling that individuals are risk-neutral (i.e., they have a linear utility function), we formalise the aforementioned ideas by assuming that the marginal utility of an entrepreneur's consumption, denoted $X(j)$, is

$$X(j) = \begin{cases} x_{t+1} & \text{if } j = H \\ 1 & \text{if } j = L \end{cases}, \quad x_{t+1} \geq 1. \quad (3)$$

The underlying idea is that the high-effort/high-return project confers a relatively higher social status to those entrepreneurs who undertake it. This may be because, given the H project's higher return, it is viewed as a more prestigious occupational choice for an entrepreneur, or because it is associated with a sense of accomplishment, as it reflects the entrepreneur's abilities and her willingness to strive for a more rewarding occupation. The recognition of these characteristics by a person's peers increases her status and, therefore, has a positive effect on her well-being. Note that the assumption through which social status impinges on the marginal utility of consumption is not an alien one. On the contrary, it is consistent with the existing literature on the economic implications of status (e.g., Fershtman *et al.* 1996; Becker *et al.* 2005; Hopkins 2011).

We shall also consider two different scenarios regarding the driving forces behind such status considerations. The limiting scenario is one where the marginal utility of consumption is constant at $x_{t+1} = \bar{x} \geq 1 \quad \forall t$. Nevertheless, it is also reasonable to consider a social norm whereby the status attached to an entrepreneur's occupational choice also depends on the society's perception on how much of an accomplishment the involvement with the high-return project actually is. Naturally, such perceptions will

(among other factors) rely upon how common was the involvement with the H project historically. After all, it is reasonable to assume that the status (e.g., due to prestige; admiration etc.) enjoyed by entrepreneurs who operate the H project, albeit still higher compared with the status attached to the alternative low-return project, will not be as high in a society where the incidence of involvement with the high-return project was more common in the past. We capture this scenario by assuming that $x_{t+1} = x(\beta_t)$ ($x' < 0$), where β_t is the number of the previous generation's entrepreneurs who invested in the H project. A general function that encompasses all the aforementioned scenarios is

$$x_{t+1} = \bar{x} - i(\bar{x} - 1)\frac{\beta_t}{n}, \quad (4)$$

where $i = \{0, 1\}$ is a binary variable. Particularly, $i = 0$ captures the case where the utility benefit of social status is independent of outcomes that transpired in the past, whereas for $i = 1$ this benefit is mitigated by the fraction of the previous generation's entrepreneurs who devoted the effort necessary in order to operate the high-return project. Notice that the differences in social status that originate from an entrepreneur's choice of investment projects disappear when $\bar{x} = 1$.

2.2 The Markets for Credit and Money

We follow others (Bencivenga and Smith 1993; Bose and Cothren 1996; Bose 2002) in assuming that the credit market operates as follows. Loan contracts are agreed upon one period in advance of a capital-producing project's operation.⁷ Therefore, in period t each worker announces a contract according to which she will offer loans in period $t + 1$ at a rate R_{t+1} per unit, to be repaid during the next period (i.e., in $t + 2$). Lenders will be approached by entrepreneurs, each of whom applies for a loan l_{t+1} . Furthermore, it is assumed that each entrepreneur can only submit one loan application.

The above imply that a worker willing to lend funds through the credit market, needs to have such funds available in period $t + 1$. However, let us imagine that the storage technology is illiquid in the following sense: Despite the fact that it offers a (gross)

⁷ This assumption ensures there will be a positive demand for money by young workers who wish to offer loans to entrepreneurs.

return $1+q$ between t and $t+2$, if prematurely liquidated (i.e., in $t+1$) it entails a cost that is proportional to the amount of stored income. We normalise this proportional cost to 1, meaning that premature liquidation is prohibitively costly. Nevertheless, there is a liquid asset in the economy that allows the possibility of storage within one period. Henceforth, this asset will be called money.

Each unit of the good in period t is exchangeable for p_t units of money, where p_t is the price level. During the next period, each unit of money can be exchanged for $\frac{1}{p_{t+1}}$ units of goods. Subsequently, these are supplied to the credit market in the form of loanable funds that can be borrowed by entrepreneurs who undertake investments in capital projects. It follows that the overall return from lending to entrepreneurs is $\frac{1+R_{t+1}}{1+\pi_{t+1}}$, where $\pi_{t+1} = \frac{p_{t+1}-p_t}{p_t}$ is the inverse of the (net) period return on money holdings - i.e., the rate of inflation.

The stock of the liquid asset is controlled by a monetary authority that supplies a quantity of money m_t every period. Following other analyses of money in models of economic growth (e.g., Ireland 1994; Schreft and Smith 1997; Varvarigos 2010) we assume that the monetary authority follows a rule whereby the supply of money evolves according to

$$m_{t+1} = (1+\mu)m_t, \quad \mu > 0. \quad (5)$$

2.3 Equilibrium

Let us begin with the reasonable assumption that the two-period return of the illiquid asset dominates the two-period return of holding money. Formally, $1+q > \frac{1}{(1+\pi_{t+1})(1+\pi_{t+2})}$. It follows that workers will be willing to offer their funds in the credit market as long as the overall return from doing so does not fall short of the overall return on storage. Given competition among workers in their role as loan providers, their net economic profit will be driven down to zero. Therefore, the equilibrium interest rate on loans is

$$R_{t+1} = (1+\pi_{t+1})(1+q) - 1. \quad (6)$$

Now, let us consider an entrepreneur who is contemplating which project to undertake after having secured a loan. Taking account of (3), the utility associated with operating the H project is⁸

$$u^H = x_{t+1}[r\varphi - (1 + R_{t+1})]l_{t+1} - Bl_{t+1}, \quad (7)$$

whereas the utility associated with the L project is

$$u^L = [r(1 - \psi)\varphi - (1 + R_{t+1})]l_{t+1}, \quad (8)$$

where $r(1 - \psi)\varphi \geq 1 + R_{t+1}$ is imposed as a type of participation constraint, ensuring that all entrepreneurs will avoid bankruptcy.⁹

Entrepreneurs will choose which project to operate by comparing the corresponding utilities in (7) and (8), with the marginal entrepreneur being the one who is indifferent between the two. Setting $u^H = u^L$ defines a threshold

$$\beta_{t+1} = x_{t+1}[r\varphi - (1 + R_{t+1})] - [r(1 - \psi)\varphi - (1 + R_{t+1})], \quad (9)$$

such that entrepreneurs with $0 \leq B \leq \beta_{t+1}$ ($\beta_{t+1} < B \leq n$) will operate the H (L) project.

Naturally, β_{t+1} is also the number of entrepreneurs who invest in the high-return/high-status project in $t+1$. Note that the condition $r(1 - \psi)\varphi > 1 + R_{t+1}$ ensures that $\beta_{t+1} > 0$.

Therefore, in order to guarantee that β_{t+1} is interior, we naturally assume that $x_{t+1}[r\varphi - (1 + R_{t+1})] - [r(1 - \psi)\varphi - (1 + R_{t+1})] < n$ holds in equilibrium.¹⁰ Furthermore, given

the preceding analysis, it is straightforward to establish that $\frac{\partial u^H}{\partial l_{t+1}}, \frac{\partial u^L}{\partial l_{t+1}} > 0$. In other

words, the amount of loan secured by each entrepreneur is bound by the amount of funds supplied by workers who offer loan contracts. Recalling that each entrepreneur can only make one loan application, and that the two groups of individuals are of equal size, it follows that

⁸ Each entrepreneur's consumption expenditures during maturity equal $r\Phi(j)l_{t+1} - (1 + R_{t+1})l_{t+1}$. Given that all individuals are risk-neutral, the presence of x_{t+1} in Eq. (7) reflects the social status associated with operating the H project in the previous period.

⁹ Note that $\frac{(1-a)(1+q)}{a(1-\psi)^2} < \left[\frac{(1-a)A\varphi}{1+\mu} \right]^2 < (1+\mu)^2(1+q)$ is a sufficient condition for both

$1+q > \frac{1}{(1+\pi_{t+1})(1+\pi_{t+2})}$ and $r(1-\psi)\varphi > 1 + R_{t+1}$ to hold simultaneously.

¹⁰ A sufficient condition is $n > [\bar{x} - (1-\psi)]aA\varphi - (\bar{x}-1)\frac{(1+q)(1+\mu)^2}{(1-a)A\varphi}$.

$$l_{t+1} = \frac{w_t}{1 + \pi_{t+1}}, \quad (10)$$

i.e., the loan is equal to the amount of funds available to each worker in period $t + 1$.¹¹

Now, let us turn to the money market equilibrium. Given the earlier discussion, the demand for money during period t is $np_t w_t$. It follows that the equilibrium in the money market is characterised by $m_t = np_t w_t$. Substituting this condition in Eq. (5) yields

$$1 + \pi_{t+1} = (1 + \mu) \frac{w_t}{w_{t+1}}, \quad (11)$$

i.e., the familiar condition that links inflation to the relative growth rates of money and (real) income.

3 Capital Accumulation and the Dynamics of Growth

Using the production technology in (1), together with (2) and the labour market equilibrium condition $N_t = n$, we can solve the profit maximisation problem to derive the following results regarding the wage w_t and the return to capital r :

$$w_t = (1 - a)A \frac{K_t}{n}, \quad (12)$$

$$r = aA. \quad (13)$$

Recall that the process of capital formation is driven by those entrepreneurs who operate the capital-producing projects H and L . Therefore, the aggregate stock of capital is given by

$$K_{t+2} = \int_0^{\beta_{t+1}} \phi l_{t+1} dB + \int_{\beta_{t+1}}^n (1 - \psi) \phi l_{t+1} dB = [n(1 - \psi) + \beta_{t+1} \psi] \phi l_{t+1}. \quad (14)$$

Combining Eq. (9) and (14), a preliminary result comes in the form of

Proposition 1. *The presence of status concerns associated with the choice of entrepreneurial projects stimulates the process of capital accumulation.*

¹¹ Note that the same outcomes associated with Eq. (6) and (10) would also apply if we dispel the idea behind a credit market altogether and assume, instead, that workers and entrepreneurs of the same age are randomly matched into pairs who agree on loan contracts. In that case, the loan rate would be the one that maximises the entrepreneur's utility subject to the lender's participation constraint.

Proof. It is $\frac{\partial K_{t+2}}{\partial x_{t+1}} = \frac{\partial K_{t+2}}{\partial \beta_{t+1}} \frac{\partial \beta_{t+1}}{\partial x_{t+1}} = \varphi l_{t+1} \psi [r\varphi - (1 + R_{t+1})] > 0$ by virtue of the condition $r(1 - \psi)\varphi > 1 + R_{t+1}$. \square

This result is quite intuitive. As long as $x_{t+1} > 1$, the marginal utility of consumption associated with operating the H project is higher due to the social status attached to it. Consequently, it increases an entrepreneur's willingness to devote the effort required in order to operate the project that returns more units of capital for each unit of loan invested in it.

The expression in (14), when combined with our previous analysis, also allows us to derive the result that is formally presented in

Proposition 2. *The rate of inflation impedes the process of capital accumulation.*

Proof. It is $\frac{\partial K_{t+2}}{\partial \pi_{t+1}} = \frac{\partial K_{t+2}}{\partial l_{t+1}} \frac{\partial l_{t+1}}{\partial \pi_{t+1}} + \frac{\partial K_{t+2}}{\partial \beta_{t+1}} \frac{\partial \beta_{t+1}}{\partial \pi_{t+1}}$. Given $\frac{\partial K_{t+2}}{\partial l_{t+1}} \frac{\partial l_{t+1}}{\partial \pi_{t+1}} = -\frac{[n(1 - \psi) + \beta_{t+1}\psi]\varphi w_t}{(1 + \pi_{t+1})^2} < 0$ and $\frac{\partial K_{t+2}}{\partial \beta_{t+1}} = \varphi \varphi l_{t+1} > 0$, the effect will be unambiguously negative as long as $\frac{\partial \beta_{t+1}}{\partial \pi_{t+1}} \leq 0$.

Indeed, combining (6) and (9), it is straightforward to establish that

$$\frac{\partial \beta_{t+1}}{\partial \pi_{t+1}} = -(x_{t+1} - 1)(1 + q) \leq 0. \quad \square$$

Inflation has two distinct, but both negative, effects on the process of capital formation. Firstly, it erodes the real value of the funds that are available in the credit market, i.e., the market where entrepreneurs seek to secure loans in order to operate their projects (see Eq. 10). Furthermore, inflation reduces the workers' return from lending relative to the return of the storage technology - an outcome that induces them to charge a higher loan rate in order to compensate for this loss (see Eq. 6). However, due to $x_{t+1} > 1$, the higher cost of borrowing has a more pronounced marginal effect on the utility of those who are attracted to the venture with the higher return. Consequently, the increased loan rate will induce fewer entrepreneurs to undertake the H project.

Our next step is to derive the economy's growth rate. To do this, we define

$$\frac{K_{t+2}}{K_{t+1}} = g_{t+2}. \quad (15)$$

Substituting (10), (11), (12) and (15) in (14) yields

$$g_{t+2} = \frac{(1-a)A\varphi}{n(1+\mu)} [n(1-\psi) + \beta_{t+1}\psi] = g(\beta_{t+1}). \quad (16)$$

As expected, given Proposition 1, the growth rate is increasing in the number of entrepreneurs who invest in the high-return project, i.e., $g' > 0$.

Now, let us substitute (4), (6), (11), (12), (13), and (16) in (9) to get

$$\beta_{t+1} = \left[\bar{x} - i(\bar{x} - 1) \frac{\beta_t}{n} \right] \left[aA\varphi - \frac{(1+q)(1+\mu)}{g(\beta_t)} \right] - \left[aA(1-\psi)\varphi - \frac{(1+q)(1+\mu)}{g(\beta_t)} \right] = f(\beta_t). \quad (17)$$

Evidently, the entrepreneurial choice of investment projects is a source of dynamics that will permeate the economy's growth performance (see Eq. 16). These transitional dynamics rest on the fact that, in the presence of status concerns, there are two distinct (and conflicting) effects that link intertemporally the number of entrepreneurs who opt for the H project. On the one hand, a higher β_t increases the growth rate of income and, therefore, reduces the rate of inflation (see Eq. 11) – an outcome that increases the workers' return from lending relative to the return of the storage technology, hence inducing them to charge a lower loan rate in the competitive credit market (see Eq. 6). Given $\bar{x} > 1$, the lower cost of borrowing has a more pronounced marginal effect on the utility of those who are attracted to the venture with the higher return. Consequently, the lower loan rate will attract more entrepreneurs towards the H project. On the other hand, however, a higher β_t may also have a direct effect on the status-induced utility increment of those entrepreneurs who invest in the high-return project, because of the social norm (see Eq. 3 and 4). This effect mitigates the potential utility benefits that stem from an entrepreneur's choice to invest in the H project, hence reducing the fraction of entrepreneurs who ultimately decide to devote the effort required in order to operate it.

We shall begin our analysis of the economy's long-run equilibrium with the baseline scenario where there are no varying status considerations emanating from an entrepreneur's involvement with any of the two available investment projects. Of course, this is a case where $\bar{x} = 1$. The long-run equilibrium outcomes associated with this scenario are summarised in

Lemma 1. *Suppose that $\bar{x} = 1$. The number of entrepreneurs who invest in the high-return project does not vary over time. Therefore, irrespective of initial conditions, the economy adjusts instantaneously to a balanced growth path characterised by \hat{g} .*

Proof. Setting $\bar{x} = 1$ in Eq. (17) yields

$$\beta_{t+1} = aA\psi\varphi \equiv \hat{\beta} \quad \forall t, \quad (18)$$

which can be substituted in (16) in order to get

$$g_{t+2} = \frac{(1-a)A\varphi}{n(1+\mu)} [n(1-\psi) + \hat{\beta}\psi] \equiv \hat{g} \quad \forall t, \quad (19)$$

thus completing the proof. \square

This result is not surprising given the discussion that followed Eq. (17) and the fact that the output production technology is (at the social level) linear to the stock of capital per person. The presence of status concerns is critical in generating the outcomes that ultimately shape the intertemporal profile of the variable β_t and, therefore, the growth rate of income. Consequently, as long as there are no forces that allow β_t to deviate from its steady state, the economy will not deviate from the balanced growth path characterised by Eq. (19).

Next, we turn our attention to the outcomes that transpire when status concerns play a role in an entrepreneur's occupational choice, i.e., when $\bar{x} > 1$. We summarise these in

Lemma 2. *Suppose that $\bar{x} > 1$.*

- i. If $i = 0$, the number of entrepreneurs who invest in the high-return project converges monotonically to a long-run equilibrium $\tilde{\beta}$. Therefore, the economy converges gradually and monotonically to a balanced growth path characterised by \tilde{g} .*
- ii. If $i = 1$, the number of entrepreneurs who invest in the high-return project converges cyclically to a long-run equilibrium $\tilde{\beta} < \tilde{\beta}$. Therefore, the economy converges gradually and cyclically to a balanced growth path characterised by $\tilde{g} < \tilde{g}$.*

Proof. Combine (16) and (17) to calculate the derivative

$$f'(\beta_t) = -(\bar{x} - 1) \frac{i(1-\psi) + \psi}{n(1-\psi) + \beta_t \psi} \left[\frac{in(1-\psi) + i\beta_t \psi}{in(1-\psi) + n\psi} aA\varphi - \frac{(1+q)(1+\mu)}{g(\beta_t)} \right]. \quad (20)$$

Furthermore, note that $f''(\beta_t) < 0$ and recall that $f(\beta_t) \in (0, n)$.

Firstly, consider $i = 0$. In this case, Eq. (20) becomes

$$f'(\beta_t) = (\bar{x} - 1) \frac{\psi}{n(1-\psi) + \beta_t \psi} \frac{(1+q)(1+\mu)}{g(\beta_t)} > 0.$$

Thus, we conclude that there is a unique $\tilde{\beta}$, such that $\tilde{\beta} = f(\tilde{\beta})$ and $f'(\tilde{\beta}) < 1$. Moreover, for $\beta_t \neq \tilde{\beta}$, convergence is monotonic given $f'(\beta_t) > 0$. Substituting in Eq. (16) yields

$$\tilde{g} = \frac{(1-a)A\varphi}{n(1+\mu)} [n(1-\psi) + \tilde{\beta}\psi]. \quad (21)$$

Since $\beta_t \neq \tilde{\beta} \Rightarrow g(\beta_t) \neq \tilde{g}$, and given Eq. (16), we can infer that the growth rate will converge to its long-run equilibrium monotonically as well.

Secondly, consider $i = 1$. Now, Eq. (20) becomes

$$f'(\beta_t) = -\frac{(\bar{x} - 1)}{n} \left[aA\varphi - \frac{n}{n(1-\psi) + \beta_t \psi} \frac{(1+q)(1+\mu)}{g(\beta_t)} \right] < 0,$$

given that $r(1-\psi)\varphi > 1 + R_{t+1}$ holds by assumption. Again, we conclude that there is a unique $\underline{\beta}$, such that $\underline{\beta} = f(\underline{\beta})$. Since $f''(\beta_t) < 0$, then $f'(n) > -1$ is a sufficient condition to ensure that $f'(\underline{\beta}) > -1$ holds as well - a condition necessary to establish the stability of the steady state equilibrium. Note that the expression $f'(n) > -1$ corresponds to

$$n - (\bar{x} - 1) \left[aA\varphi - \frac{n}{n(1-\psi) + \beta_t \psi} \frac{(1+q)(1+\mu)}{g(\beta_t)} \right] > 0.$$

It is sufficient to show that this expression holds for the minimum possible n . Indeed, using the condition in Footnote 10, we can establish that

$$\begin{aligned} & [\bar{x} - (1-\psi)]aA\varphi - (\bar{x} - 1) \frac{(1+q)(1+\mu)^2}{(1-a)A\varphi} - (\bar{x} - 1) \left[aA\varphi - \frac{n}{n(1-\psi) + \beta_t \psi} \frac{(1+q)(1+\mu)}{g(\beta_t)} \right] \Rightarrow \\ & [\bar{x} - (1-\psi)]aA\varphi - (\bar{x} - 1) \frac{(1+q)(1+\mu)}{g(n)} - (\bar{x} - 1)aA\varphi + (\bar{x} - 1) \frac{n}{n(1-\psi) + \beta_t \psi} \frac{(1+q)(1+\mu)}{g(\beta_t)} \Rightarrow \\ & aA\varphi\varphi - (\bar{x} - 1)(1+q)(1+\mu) \left[\frac{1}{g(n)} - \frac{n}{n(1-\psi) + \beta_t \psi} \frac{1}{g(\beta_t)} \right]. \end{aligned} \quad (22)$$

Given $\beta_t \leq n$ and $g' > 0$, the expression in (22) is unambiguously positive, thus establishing that $\tilde{\beta}$ is an asymptotically stable steady state. Furthermore, convergence towards the steady state is cyclical given $f'(\beta_t) < 0$. To obtain the long-run growth rate, we substitute in Eq. (16) to get

$$\tilde{g} = \frac{(1-a)A\varphi}{n(1+\mu)}[n(1-\psi) + \tilde{\beta}\psi]. \quad (23)$$

Since $\beta_t \neq \tilde{\beta} \Rightarrow g(\beta_t) \neq \tilde{g}$, and given Eq. (16), we can infer that the growth rate will converge to its long-run equilibrium through cycles (damped oscillations).

Finally, note that, by virtue of Eq. (17), we have $\frac{\partial f(\cdot)}{\partial i} < 0$. Consequently, $\beta_t < \tilde{\beta}$ - a result that can be used together with (21) and (23) to establish that $\tilde{g} < \tilde{g}$. \square

In order to facilitate the exposition of the mechanisms underlying Lemma 2, recall the discussion that followed Eq. (17) and consider the effects of a higher β_t on β_{t+1} . When the impact of social status on the marginal utility of consumption is positive, but independent of past outcomes (i.e., $\bar{x} > 1$ and $i = 0$), the effect is unambiguously positive due to the fact that an increase in β_t increases the growth rate, reduces inflation and the loan rate, thus attracting more entrepreneurs towards the high-return project because, with status concerns, the utility associated with this project is more responsive to these changes. Consequently, when $\beta_t < \tilde{\beta}$ ($\beta_t > \tilde{\beta}$), the number of entrepreneurs who invest in the H project will be increasing (decreasing) over time as it converges to its steady state (see Figure 1). Similarly, the growth rate will adjust gradually and monotonically to its long-run equilibrium since it is an increasing function of the fraction of entrepreneurs who operate the project that returns more capital goods per unit of investment.

Nevertheless, when the impact of social status on the marginal utility of consumption is positive but mitigated by outcomes that transpired in the past (i.e., $\bar{x} > 1$ and $i = 1$) there is an additional mechanism through which β_t impinges on β_{t+1} . By reducing the increment of the marginal utility of consumption - an effect that is attributed to the idea that the social status attached to the decision to devote effort and operate a more rewarding project is less pronounced in circumstances where more entrepreneurs took a

similar decision in the past – this effect is a negative one. In fact, it dominates the positive effect to which we alluded earlier. As a result, when $\beta_t \neq \tilde{\beta}$, the number of entrepreneurs who invest in the H project converges to its steady state through cycles (see Figure 2). In terms of intuition, consider a relatively high (low) realisation of β_t . This will reduce (increase) the current utility benefits that stem from an entrepreneur’s choice to operate the high-return project, hence reducing (increasing) the fraction of entrepreneurs who ultimately decide to invest in it. Given that the growth rate is an increasing function of the fraction of entrepreneurs who operate the project that returns more capital goods per unit of investment, the cyclical nature of β_t will be the underlying cause for the emergence of cycles in the economy’s growth performance, as it gradually converges to the balanced growth path.

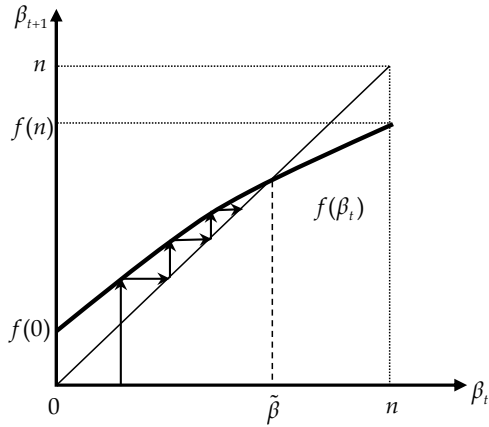


Figure 1. Phase diagram ($i = 0$)

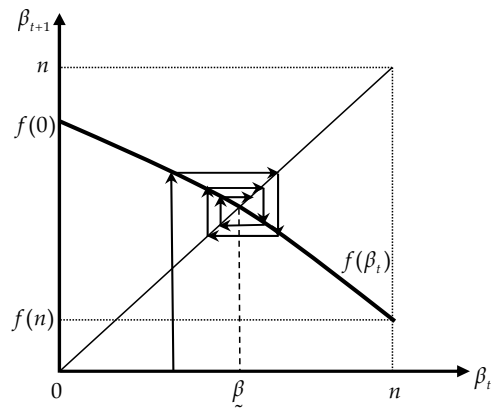


Figure 2. Phase diagram ($i = 1$)

One implication from the preceding analysis is presented in

Proposition 3. *The impact of status concerns in the choice of entrepreneurial projects is an additional source of transitional dynamics, even when the status-induced increase of marginal utility is time-invariant.*

Proof. It follows from Lemmas 1 and 2. \square

It is well-known that in the presence of an AK -type technology, the economy adjusts instantaneously to a balanced growth path – i.e., a time-invariant growth rate – irrespective of initial conditions (e.g., Acemoglu 2009). In our model, this outcome emerges only in the absence of any status considerations associated with an entrepreneur’s occupational choice. Nevertheless, when status impinges on this choice, the adjustment to the balanced growth path is gradual, irrespective of whether the status-induced increase of marginal utility is fixed ($i = 0$) or varies over time due to the social norm ($i = 1$).

Despite the fact that transitional dynamics emerge regardless of the fundamental characteristics of the status-induced utility benefits, there are still important implications that emanate from the two different scenarios that capture these characteristics. Specifically, the shape of the economy’s dynamics towards the long-run equilibrium, as well as the long-run equilibrium itself, differ in each case. The upshot from the comparison of these two cases is formally presented in

Proposition 4. *The underlying characteristics of social status generate a relation between cyclical volatility and growth in the sense that when $i = 0$, the economy converges monotonically to a growth rate which is higher compared to the growth rate when $i = 1$, to which the economy converges cyclically.*

Proof. It follows from Lemmas 1 and 2. \square

The majority of existing theories on the growth-volatility nexus have investigated this issue on the basis of stochastic growth models that allowed researchers to examine circumstances under which the (exogenous) volatility generated by stochastic terms impinges on the economy’s long-term growth. Our paper offers a different approach which, contrary to these analyses, does not stem from the presence of exogenous shocks. In our framework, the structural characteristic (in this case, status) that is responsible for the emergence of cycles, is also an important characteristic in determining the long-term prospects of the economy. Put differently, here the correlation between growth and

cycles reflects the idea that cyclical growth converges to a lower value in the long-run, compared with a growth rate that is smoother (i.e., monotonic) during the transition.

Note that the implications can be generalised to the case where, rather than treating i as a binary variable, we consider it as a parameter that takes values on $[0,1]$, thus measuring the magnitude of the social norm – i.e., the direct effect of past realisations of β_t on the current generation’s perceptions regarding the status associated with the high-return project. Given the complexity of doing so, we are going to examine the implications for the function in Eq. (17) and, therefore, the economy’s dynamics, by means of a numerical example.¹² In Figure 3, we employ a 3-dimensional plot of $f(\beta_t)$ against β_t and i . As we can see, these general results are consistent with the implications of Lemma 2 and Proposition 4. Specifically, we can see that the slope of $f(\beta_t)$ changes from positive to negative as we increase the value of i . Consequently, we can infer that the higher the strength of the social norm, the more likely it is that the steady state will lie on the downward-sloping part of $f(\beta_t)$, thus leading to damped oscillations (i.e., cycles) in the transition to the steady state.

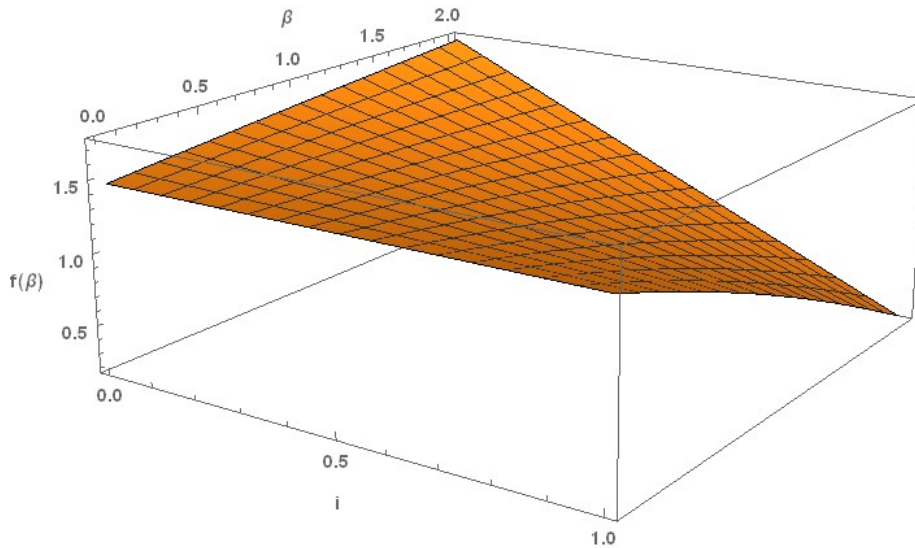


Figure 3. The slope of $f(\beta_t)$ when $i \in [0,1]$

¹² The parameter values we use for this example are $a = 0.4$; $A = 2$; $\varphi = 2.5$; $q = 0.2$; $\mu = 0.75$; $n = 2$; and $\bar{x} = 3$.

4 Summary and Discussion

The model we developed in this paper represents yet another attempt to shed more light on the macroeconomic implications of social status concerns. Assuming that such concerns apply to the involvement with investment projects that produce capital goods, we have shown that the impact of status on the macroeconomic environment goes beyond its effect on the growth rate. In addition to its impact on long-term macroeconomic performance, the status-induced increase of the marginal utility of those entrepreneurs who devote effort and operate the high-return project, is also a source of transitional dynamics. The shape of these dynamics (monotonic or cyclical) depends on the underlying characteristics that drive status concerns. As a result, we have employed these characteristics as a means of inferring a relation between growth and cyclical volatility.

Our framework brings forth some interesting policy implications. Given the beneficial effect of status on macroeconomic performance, there is perhaps scope for supporting activities directed towards people's aspirations – for example, activities that will instil into successive generations of individuals the idea that the pursue of more rewarding/productive occupations results in benefits that are not solely restricted to high income. Instead, such occupations can offer additional rewards, such as recognition, admiration, prestige, and all other characteristics that confer status. Another policy implication relates to the negative relation between cyclical volatility and growth. Stochastic growth models that generate this relation suggest that conventional stabilisation policies – designed to eradicate the volatility stemming from exogenous shocks – may entail additional benefits in terms of improved growth performance. In our model, there is clearly no scope for such policies. This is because there is no underlying causal effect that underpins the cyclical volatility-growth nexus. On the contrary, both growth and cycles are endogenously determined by the relative strength of the social norm that governs the status accruing to entrepreneurs who invest in the more productive project. Hence, an appropriate policy should be one that can somehow impinge directly on people's perceptions and reduce the magnitude of this norm. Such a policy will improve the economy's growth prospects while, at the same time, alleviating the forces that are responsible for the emergence of cycles.

References

1. Acemoglu, D. 2009. *Introduction to Modern Economic Growth*. Princeton University Press, New York.
2. Azariadis, C., and Smith, B.D. 1996. "Private information, money, and growth: Indeterminacy, fluctuations, and the Mundell-Tobin effect," *Journal of Economic Growth*, 1, 309-332.
3. Bakshi, G.S., and Chen, Z. 1996. "The spirit of capitalism and stock-market prices," *American Economic Review*, 86, 133-157.
4. Becker, G.S., Murphy, K. M., and Werning, I. 2005. "The equilibrium distribution of income and the market for status," *Journal of Political Economy*, 113, 282-310.
5. Bencivenga, V.R., and Smith, B.D. 1993. "Some consequences of credit rationing in an endogenous growth model," *Journal of Economic Dynamics and Control*, 17, 97-122.
6. Bose, N. 2002. "Inflation, the credit market, and economic growth," *Oxford Economic Papers*, 54, 412-434.
7. Bose, N., and Cothren, R. 1996. "Equilibrium loan contracts and endogenous growth in the presence of asymmetric information," *Journal of Monetary Economics*, 38, 363-376.
8. Canton, E. 2002. "Business cycles in a two-sector model of endogenous growth," *Economic Theory*, 19, 477-49.
9. Chang, W.Y., Hsieh, Y.N., and Lai, C.C. 2000. "Social status, inflation, and endogenous growth in a cash-in-advance economy," *European Journal of Political Economy*, 16, 535-545.
10. Collins, C. J., Hanges, P. J., and Locke, E. A. 2004. "The relationship of achievement motivation to entrepreneurial behavior: A meta-analysis," *Human Performance*, 17, 95-117.
11. Corneo, G., and Jeanne, O. 1997. "On the relative wealth effects and the optimality of growth," *Economics Letters*, 1997, 54, 87-92.
12. Corneo, G., and Jeanne, O. 2001. "Status, the distribution of wealth, and growth," *Scandinavian Journal of Economics*, 103, 283-293.

13. Femminis, G. 2001. "Risk-sharing and growth: The role of precautionary savings in the 'education' model," *Scandinavian Journal of Economics*, 103, 63-77.
14. Fershtman, C., Murphy, K.M., and Weiss, Y. 1996. "Social status, education, and growth," *Journal of Political Economy*, 104, 108-132.
15. Futagami, K., and Shibata, A. 1998. "Keeping one step ahead of the Joneses: Status, the distribution of wealth, and long-run growth," *Journal of Economic Behaviour and Organization*, 36, 109-126.
16. Gong, L., and Zou, H.F. 2001. "Money, social status, and capital accumulation in a cash-in-advance model," *Journal of Money, Credit and Banking*, 33, 284-293.
17. Heffetz, O., and Frank, R.H. 2011. "Preferences for status: Evidence and economic implications," in Benhabib, J., Bisin, A., and Jackson, M.O. (Eds.): *Handbook of Social Economics Vol. 1A*. North-Holland, Amsterdam.
18. Hirsch, F. 1976. *The Social Limits to Growth*. Harvard University Press, Cambridge (MA).
19. Hollingshead, A.B. 1975. "Four factor index of social status," mimeo, Department of Sociology, Yale University.
20. Hopkins, E. 2011. "Inequality and risk-taking behaviour," discussion paper no. 204, School of Economics, University of Edinburgh.
21. Ireland, P. 1994. "Money and growth: An alternative approach," *American Economic Review*, 84, 47-65.
22. Koren, M., and Tenreyro, S. 2007. "Volatility and development," *Quarterly Journal of Economics*, 122, 243-287.
23. Malach-Pines, A., Levy, H., Utasi, A., and Hill, T.L. 2005. "Entrepreneurs as cultural heroes," *Journal of Managerial Psychology*, 20, 541-555.
24. Martin, P., and Rogers, C.A. 2000. "Long-term growth and short-term economic instability," *European Economic Review*, 44, 359-381.
25. Ramey, G., and Ramey, V. 1995. "Cross-country evidence on the link between volatility and growth," *American Economic Review*, 85, 1138-1151.
26. Rauscher, M. 1997, "Conspicuous consumption, economic growth, and taxation," *Journal of Economics*, 66, 35-42.

27. Romer, P.M. 1986. "Increasing returns and long-run growth," *Journal of Political Economy*, 94, 1002-1037.
28. Scheinberg, S., and MacMillan, I. C. 1988. "An 11 country study of motivations to start a business," in Kirchoff, B., Long, W., McMullan, W., Vesper, K. H., and Wetzel, W. (Eds.): *Frontiers of Entrepreneurship Research*. Babson College, Wellesley (MA).
29. Schreft, S.L., and Smith, B.D. 1997. "Money, banking, and capital formation," *Journal of Economic Theory*, 73, 157-182.
30. Shane, S., Kolvereid, L., and Westhead, P. 1991. "An exploratory examination of the reasons leading to new firm formation across country and gender," *Journal of Business Venturing*, 6, 431-446.
31. Tournemaine, F., and Tsoukis, C. 2008. "Relative consumption, relative wealth and growth," *Economics Letters*, 100, 314-316.
32. Van Praag, M. 2011. "Who values the status of the entrepreneur?" in Audretsch, D. (Ed.): *Handbook of Research on Innovation and Entrepreneurship*. Edward Elgar, Northampton (MA).
33. Varvarigos, D. 2010. "Inflation, volatile public spending, and endogenously sustained growth," *Journal of Economic Dynamics and Control*, 34, 1893-1906.
34. Varvarigos, D. 2011. "Non-monotonic welfare dynamics in a growing economy," *Journal of Macroeconomics*, 33, 303-312.
35. Veblen, T. 2007 [1899]. *The Theory of the Leisure Class: An Economic Study of Institutions*. Oxford University Press, Oxford.
36. Weber, M. 1992 [1904]. *The Protestant Ethic and the Spirit of Capitalism*. Translated by T. Parsons. Routledge, London.
37. Weiss, Y., and Fershtman, C. 1998. "Social status and economic performance: A survey," *European Economic Review*, 42, 801-820.
38. Wendner, R. 2010. "Growth and keeping up with the Joneses," *Macroeconomic Dynamics*, 14, 176-199.
39. Zou, H.F. 1994. "'The spirit of capitalism' and long-run growth," *European Journal of Political Economy*, 10, 279-293.