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## Status Concerns and the Schooling Decision

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# Status Concerns and Interdependent Labor Markets

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## Abstract

We investigate the influence of status concerns on the labor supply and wages on the interdependent labor markets for academic and non-academic workers. The endogenous status in our model is considered as a non-monetary benefit that academic workers receive in addition to their consumption utility. This is consistent with Social Identity Theory where individuals desire to be member of a group which is positively differentiated in comparison with other groups. We find that, under certain conditions, higher status concerns increase the labor supply and decrease the wage for academic workers in equilibrium. Moreover, the wage for non-academic workers increases.

*JEL classification:* J20, J31, Z13

*Keywords:* Status Concerns, Labor Supply, Wages

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# 1 Introduction

The increase in the demand for higher education many countries have experienced over the past (Barro and Lee (2013)) has caused doubts that an increasing number of highly educated workers might affect labor markets in a negative way. While there are controversial opinions on the desirableness of more highly educated workers and the effects on the labor market, one main question which needs to be addressed is why the demand for educational attainment has increased in such a degree. Besides several economic and monetary reasons for demanding credential degrees, there is considerable evidence suggesting that there are also non-pecuniary factors influencing individual behavior and economic outcomes.

In this context, an individual's social environment has become increasingly important in economic analysis. A person's desire to be seen in a positive light by himself and others often motivates the wish to belong to a certain group. Hence, individuals divide themselves and others into different social categories, defined by nation, wealth, religion or gender, for instance. To symbolize certain properties (e.g. wealth), people consume goods that are assumed to generate higher social status (Leibenstein (1950)). Thus, if educational attainment divides the society into categories differing in their social status, people are likely to demand higher education to be assigned to the high status group.

This paper aims to explore the influence of status concerns on the labor supply and wages on the interdependent labor markets for academic and non-academic workers. We consider a population of agents with different ability levels. Each agent chooses to join either the academic or the non-academic workforce. Agents joining the academic workforce incur an education cost which is decreasing in the agent's ability. Belonging to the academic workforce is associated with a non-monetary utility from social status in addition to a consumption utility. Status is assumed to be decreasing in the number of agents that choose to become academics. In contrast, joining the non-academic workforce is associated with a consumption utility only. We analyze the optimal labor supply decision under rational expectations. Then, we use a general framework to conduct comparative statics exercises with respect to changes in status concerns, which are captured by changes of an intensity parameter.

For the case where academic and non-academic workers are substitutes, we find that higher status concerns increase the labor supply and decrease the wage for academic workers in equilibrium. Moreover, the wage for non-academic workers increases. Accordingly, status concerns may help to explain situations in which a large proportion of a population demands higher education although the associated wage premium is rather low.

Our approach contributes to two areas of research. The first research area relies on finding the reasons for demanding higher education. Following the human capital theory (Becker (1964)), individuals demand education if the expected benefits are greater than the costs incurred. These benefits have been examined by a large body of literature: many determinants for education have been exhibited, covering social, individual, economic and demographic factors.<sup>1</sup>

The second research area addresses the desire of individuals to obtain or maintain a positive self-image. Our assumption of social status being an additional determinant for demanding higher education is based on Social Identity Theory (Tajfel and Turner (1979)). Following this theory, individuals want to be assigned to groups that are perceived to be positively differentiated by comparison with other groups to achieve high personal prestige produced by the membership of that group. This tendency to identify with high status groups is highlighted by a large body of social psychological studies (e.g. Ellemers et al. (1988), Roccas (2003)). A systematic introduction of identity - an individual's sense of self - into economic analysis is particularly attributed to the work of Akerlof and Kranton (2000), who mention identity as a motivation for behavior. In our model, the high social group is represented by those individuals holding an academic degree, received by higher education. We distinguish between indirect utility from consumption and social status so that the choice which labor market to join becomes both an economic and social decision. This is in contrast to the approach where status is represented by material payoff, which is often used in theoretical literature (see Lindquist and Östling (2013), Shayo (2009), for instance).

To our knowledge, there is only a small amount of literature addressing the influence of status concerns on the educational choice. Our approach is most closely related to that of

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<sup>1</sup>For country specific empirical analysis on the demand for higher education, see Menon (1998) for the case of Cyprus, for instance.

Breen and Goldthorpe (1997), who regard an individual's socio-economic status in their model. While our model is focused on obtaining social status, Breen and Goldthorpe (1997) take into account that individuals might want to prevent downward mobility, that is, the assignment to a lower class compared to their original social class. Individuals are assumed to demand the educational level needed to preserve the level of social status achieved by their parents. Otherwise, they experience a status loss, which is larger the higher the original class position.

The rest of the paper is organized as follows. In the next section, we present our model. The equilibrium analysis is given by Section 3, also illustrated by a linear model as a special case of our model.

## 2 The Model

We consider an economy populated by one firm and many workers with mass normalized to one. Each worker is associated with an ability  $a$  known only to himself. Abilities are uniformly distributed over the range  $[0, 1]$ . Every worker has to take a decision on education. He may attend university, obtain a degree, and subsequently will be employed in the market for academics. Alternatively, he chooses to join the non-academic workforce without graduating in advance. Each worker's choice is publicly observable. Let  $w_h$  ( $w_l$ ) denote the wage on the labor market for (non-)academics. Then, workers derive the indirect utility  $\tilde{u}(w)$  from consumption,  $w \in (w_l, w_h)$ .<sup>2</sup> The indirect utility function  $\tilde{u}(\cdot)$  is assumed to be continuously differentiable, strictly increasing and weakly concave. Attending university is associated with the extra utility loss  $C(\cdot) \geq 0$ ,  $C'(\cdot) < 0$  and with the extra utility gain  $S \geq 0$ . Let  $C(\cdot) = C(a)$ . By  $C'(a) < 0$ , higher education can be easier acquired by workers with higher ability.  $S$  can be interpreted as utility from social status that is associated with the academic workforce. We assume that  $S = S(H^S)$ ,  $S'(H^S) < 0$ , where  $H^S$  denotes the labor supply of academic workers. Accordingly, status concerns may reflect the desire to be identified with an exclusive group, which is in the tradition of Tajfel and Turner (1979). The firm in our model is a monopolist on the output market that employs academic and non-academic workers to produce a given level of

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<sup>2</sup>This implies implicitly that goods prices are exogenously given.

output. Academic and non-academic workers are assumed to be imperfect substitutes in production. Let the solution of the firm's cost-minimization problem result in the factor demand functions  $H^D(w_h, w_l)$  for academics and  $L^D(w_h, w_l)$  for non-academics. We make the standard assumptions that both functions are continuously differentiable in all their arguments. Moreover, let  $\frac{\partial H^D}{\partial w_h} < 0$ ,  $\frac{\partial H^D}{\partial w_l} > 0$ ,  $\frac{\partial L^D}{\partial w_l} < 0$ ,  $\frac{\partial L^D}{\partial w_h} > 0$ . Accordingly, both demand functions are downward-sloping in the corresponding wage. The demand for higher educated workers increases in the wage of less educated workers and *vice versa*. This incorporates that academic and non-academic workers are substitutes. It is assumed implicitly that each worker's marginal product is determined by skills acquired during an education period. In particular, it is not affected by the ability.

### 3 Equilibrium

An equilibrium in our model requires that each worker makes an optimal education choice given the other workers' choices and that wages for academics and non-academics clear both labor markets. We start our analysis with the education decision for given wages  $w_h, w_l$ .

**Lemma 1.**

*Let  $w_h, w_l, s$  be given. Then there exists a threshold-ability  $\tilde{a} \in \mathbb{R}$ , so that the following decision rule maximizes the utility of workers with ability  $a$ : choose the academic education if and only if  $a \geq \tilde{a}$ .*

*For the proof: see Appendix A.1.*

Let  $H^S(L^S)$  denote the labor supply of (non-)academics. Then  $L^S = \min\{\tilde{a}, 1\}$  and  $H^S = \max\{1 - \tilde{a}, 0\}$ . Since the threshold ability determines the group size of academics and non-academics, the status function can be represented by  $S(\tilde{a})$ ,  $S'(\tilde{a}) > 0$ . If  $\tilde{a} \in [0, 1]$ , the threshold  $\tilde{a}$  describes both the number of workers not to demand higher education and the share of population employed in the labor market for non-academics. We show the following proposition.

**Proposition 1.**

*Suppose that*

$$\frac{\partial H^D}{\partial w_h} \frac{\partial L^D}{\partial w_l} - \frac{\partial H^D}{\partial w_l} \frac{\partial L^D}{\partial w_h} \neq 0 \quad \text{for each } w_h, w_l.$$

Then there exists a unique equilibrium  $(w_h^*, w_l^*, a^*)$ .

For the proof: see Appendix A.2.

In the following we analyze a simple linear model.

### The Linear Model

Let the functions take the following form:

$$H^D(w_h, w_l) = 1 - w_h + \alpha w_l, \quad L^D(w_h, w_l) = 1 - w_l + \beta w_h,$$

$$S(\tilde{a}) = \sigma \tilde{a}, \quad C(a) = c(1 - a), \quad \tilde{u}(w) = w$$

$$\text{where } \alpha, \beta \in [0, 1), \quad c > 0, \quad \sigma \geq 0.$$

The parameters  $\alpha$  and  $\beta$  determine the substitutionality between academic and non-academic workers.

For given wages, the threshold ability is defined by

$$\begin{aligned} w_h + \sigma \tilde{a} - c(1 - \tilde{a}) &= w_l \\ \Leftrightarrow \tilde{a} &= \frac{w_l - w_h + c}{\sigma + c}. \end{aligned} \tag{1}$$

It is easy to see that the threshold decreases when wages for academics increase or wages for non-academics decrease. However, since the threshold  $\tilde{a}$  determines labor supply for academics and non-academics, the market clearing wages will adjust after every change of  $\tilde{a}$ . The market clearing conditions are given by

$$1 - w_h + \alpha w_l = 1 - \tilde{a}, \tag{2}$$

$$1 - w_l + \beta w_h = \tilde{a}. \tag{3}$$

Solving the system of Equations (1)-(3) leads to the equilibrium of the linear model:

$$w_l^* = \frac{1 + c\beta + \sigma}{2 - \alpha - \beta + c(1 - \alpha\beta) + \sigma - \alpha\beta\sigma}, \tag{4}$$

$$w_h^* = \frac{1 + c + \alpha\sigma}{2 - \alpha - \beta + c(1 - \alpha\beta) + \sigma - \alpha\beta\sigma}, \tag{5}$$

$$a^* = \frac{1 - \alpha + c(1 - \alpha\beta)}{2 - \alpha - \beta + c(1 - \alpha\beta) + \sigma - \alpha\beta\sigma}. \tag{6}$$

An increasing concern for social status - represented by a higher  $\sigma$  - constitutes a supply shock on labor markets for academic and non-academic workers. After an adjustment process, status concerns have the following effects on wages and labor supply in equilibrium:

$$\frac{\partial w_l^*}{\partial \sigma} = \frac{(1 - \beta)(1 - \alpha + c(1 - \alpha\beta))}{(2 - \alpha - \beta + c(1 - \alpha\beta) + \sigma - \alpha\beta\sigma)^2}, \quad (7)$$

$$\frac{\partial w_h^*}{\partial \sigma} = \frac{(\alpha - 1)(1 - \alpha + c(1 - \alpha\beta))}{(2 - \alpha - \beta + c(1 - \alpha\beta) + \sigma - \alpha\beta\sigma)^2}, \quad (8)$$

$$\frac{\partial a^*}{\partial \sigma} = \frac{(\alpha\beta - 1)(1 - \alpha + c(1 - \alpha\beta))}{(2 - \alpha - \beta + c(1 - \alpha\beta) + \sigma - \alpha\beta\sigma)^2}. \quad (9)$$

By Equations (7)-(9), it is straightforward to proof the following proposition.

**Proposition 2.** *In the linear model, social status concerns have the following effects:*

$$\begin{aligned} \text{wages:} \quad & \frac{\partial w_h^*}{\partial \sigma} < 0, \quad \frac{\partial w_l^*}{\partial \sigma} > 0 \\ \text{employment:} \quad & \frac{\partial H^*}{\partial \sigma} > 0, \quad \frac{\partial L^*}{\partial \sigma} < 0. \end{aligned}$$

Figure 1 illustrates a numerical example for the effects of social status. The demand and supply functions in Figure 1 are depicted for  $\sigma = 0.6$ , whereas the benchmark solution corresponds to  $\sigma = 0$ .

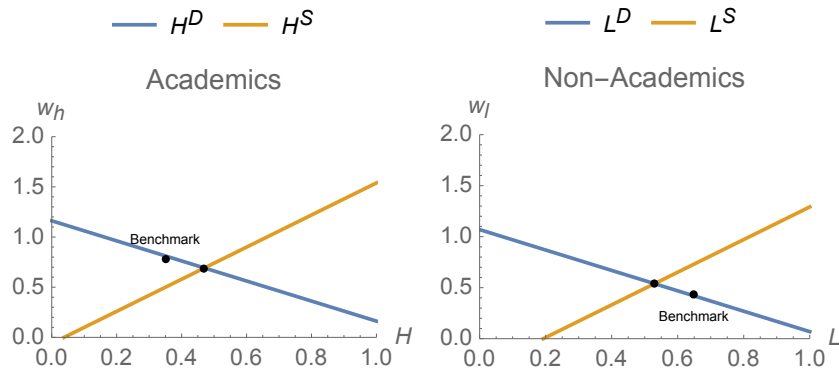


Figure 1: Effects of Social Status on the Labor Markets,

$$c = 1.0, \alpha = 0.3, \beta = 0.1, \sigma = 0.6.$$



Academic workers derive a non-pecuniary utility from the social status associated with their exclusive education. However, when high social status induces many individuals to attain a university degree, the consumption utility of highly educated workers decreases. Due to the high labor supply on the market for academics, the wages for academics decrease while wages for non-academics increase due to a shortage. The relative wage is given by

$$\frac{w_h^*}{w_l^*} = \frac{1 + c + \alpha\sigma}{1 + c\beta + \sigma}. \quad (10)$$

Figure 2 illustrates a numerical example for the relationship between status and the relative wage. While wages increase in both substitution parameters -  $\alpha$  and  $\beta$  - , the relative wage increases in  $\alpha$  and decreases in  $\beta$ .

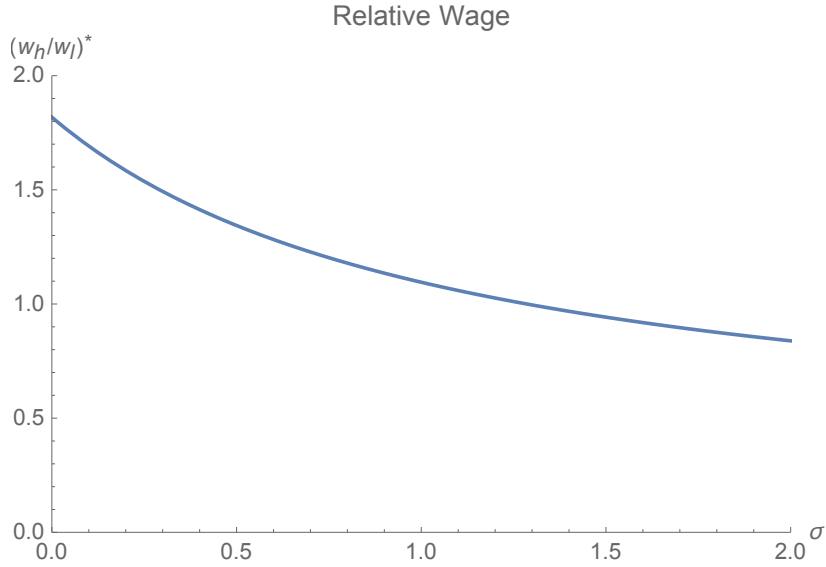


Figure 2: Relative Wage,  
 $c = 1.0, \alpha = 0.3, \beta = 0.1$ .

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## A Proofs

### A.1 Proof of Lemma 1

Let  $\hat{a} \in \mathbb{R}$  and define  $\Omega(\hat{a}) \equiv \tilde{u}(w_h) - \tilde{u}(w_l) + S - C(\hat{a})$ . By  $C'(\cdot) < 0$ ,  $\Omega(\hat{a})$  is strictly monotonously increasing. If  $\hat{a} \in [0, 1]$ ,  $\Omega(\hat{a})$  is the utility differential between an academic worker and a non-academic worker with the same ability  $a = \hat{a}$ . Define  $\tilde{a} = \{\hat{a} : \Omega(\hat{a}) = 0\}$ . It follows then from the monotonicity of  $\Omega(\hat{a})$  that  $\tilde{a}$  is unique and that each worker with ability  $a \geq \tilde{a}$  achieves higher utility by choosing the academic education compared to the non-academic education. If  $\tilde{a} < 0$  ( $> 1$ ), there exists no worker with ability  $\tilde{a}$ . However, it is straightforward that every (no) worker optimally chooses the academic education if  $\tilde{a} < 0$  ( $> 1$ ), which proves the lemma.  $\square$

### A.2 Proof of Proposition 1

The following conditions has to be fulfilled in equilibrium:

$$\begin{aligned} L^D(w_h^*, w_l^*) - a^* &= 0, \\ H^D(w_h^*, w_l^*) - 1 + a^* &= 0. \end{aligned}$$

According to Gale and Nikaido (1965, Theorem 7), there exists a unique solution if the diagonal entries of the Jacobian matrix do not change signs and if the determinant of the Jacobian does not vanish. The Jacobian matrix in our model is given by

$$\begin{pmatrix} \frac{\partial H^D}{\partial w_h} & \frac{\partial H^D}{\partial w_l} \\ \frac{\partial L^D}{\partial w_h} & \frac{\partial L^D}{\partial w_l} \end{pmatrix}.$$

Note that by  $\frac{\partial H^D}{\partial w_h} < 0$ ,  $\frac{\partial L^D}{\partial w_l} < 0$  the diagonal entries both have the same sign. Furthermore, the determinant is different from zero if

$$\frac{\partial H^D}{\partial w_h} \frac{\partial L^D}{\partial w_l} - \frac{\partial H^D}{\partial w_l} \frac{\partial L^D}{\partial w_h} \neq 0,$$

which proves the proposition.  $\square$