

Keeping Up with Your Co-workers: Static Model of Labor Supply with Social Preferences

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Abstract

Recent experimental and empirical evidence points to meaningful social interactions effects in the labor market and calls for testable predictions about the labor supply. We develop and analyze a general static labor supply model with additive negative spillover effects where workers experience disutility when their work hours are below their colleagues' work hours. The results provide prediction that under reasonable assumptions an increase in hours worked for the co-workers will increase the individual labor supply.

Keywords: labor supply, spillover effect, social preference, social interactions.

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1. Introduction

Ever since the classic paper on the rat race in the workplace (Akerlof 1976) there has been an increasing interest in how workers interact with each other, beyond the market interactions through wages and contracts. The recent models of social interactions in the labor setting range from conformity effect (Nakamoto 2009) to envy (Kragl and Schmid 2009). The strong interest in modeling interdependence is warranted by both the experimental evidence and empirical research which point to meaningful and non-negligible social interactions effects in the labor market where workers may interact with each other due to multiple motives (Fehr et al 2009). The research shows that, among compensation or status, the effort level is strongly affected even if there are no monetary incentives to perform better than the co-workers (Falk and Ichino 2006, Mas and Moretti 2009).

In order to obtain clear predictions for empirical research we use general additive utility function with social preferences proposed in Levitt and List (2007). In our static model of labor supply the moral payoff is being represented by disutility when individual's work hours are below their colleagues' work hours. The strength of the norm is multiplicative, following proportional spillover effect introduced in Brock and Durlauf (2000). The analysis follows Grodner and Kniesner (2008a) to provide prediction that under reasonable assumptions an increase in the hours worked for the co-workers will increase the individual labor supply. Also, due to the unique nature of the labor supply, where hours worked is a non-good, the effect of interactions is non-linear, with the extreme levels of interdependence not having a significant effect.

2. Model

We assume that the labor market is at the equilibrium in the sense of Durlauf (1996) with a developed neighborhood structure. In the following discussion we use the terms membership group, neighborhood, and community as equivalent and meaning individuals who are part of the individual's reference group.

Consider a labor supply model with a negative spillover effect in hours worked:

$$\begin{aligned} V_{ig}(c_{ig}, h_{ig}; b_g(\mu_{hg})) &= u_{ig}(c_{ig}, T - h_{ig}) - b_g(\mu_{hg})s(h_{ig}) \\ \text{st. } c_{ig} &\leq h_{ig}w_g, \end{aligned} \quad (1)$$

where $V_{ig}(\bullet)$ represents total utility of person i who belongs to the reference group g , $u(\bullet)$ represents a private utility over c (consumption), $(T - h)$ is leisure (where T is total available time and h is hours worked/labor supply), and $[-b_g(\mu_{hg})s(h_{ig})]$ is total social disutility of working. Total disutility of hours worked depends on the level of $b_g(\bullet)$, which represents the importance of social disutility in total utility in the reference group g , where in turn $b_g(\bullet)$ is an increasing function of the average hours worked in the worker's reference group, μ_{hg} , excluding the i th worker (thus $\mu_{hg} = \bar{h}_{(-i)g}$), with $b_g(0) = 0$, $b_g(\infty) \rightarrow \infty$, and $b'_g > 0$. Total social disutility also depends on $s(\bullet)$, which represents the social disutility of individual hours worked (disutility of the individual from how others judge his or her work level) with $s(0) = s_0 > 0$, $s(\infty) \rightarrow 0$, $s' < 0$, and $s'' > 0$; s_0 is autonomous social disutility, which is equal across individuals and reference groups. Finally, w_g is a wage rate in the reference group g .

Remark 1. Social disutility of individual's hours worked $s(\bullet)$ is always non-zero with the maximum value s_0 at zero hours worked. The baseline level of social disutility s_0 is exogenous, and we begin by assuming that it is constant for all individuals across all groups. The

homogeneity assumption is important because if s_0 varies either across individuals due to heterogeneity or across the groups due to reference-group specific characteristics, then it is impossible to disentangle the effect of importance of social utility $b(\bullet)$ from the effect of different values for autonomous social utility s_0 .

Remark 2. The social disutility of individual's hours worked seems most likely to be decreasing ($s' < 0$) at a decreasing rate ($s'' > 0$). The decrease of the social disutility means that as individuals work more hours they believe that others judge them less harshly. On the other hand, the decrease of social disutility at a decreasing rate means that as individuals work more hours the gain of appearing better in the eyes of peers is getting smaller. The worker may view certain levels of hours worked as satisfactory and care less and less about opinions of others as long as the worker reaches some accepted levels of hours worked (according to his or her personal belief system).

Remark 3. Notice that we assume that the importance of the social utility term, b , is an increasing function of the average hours worked in the individual's reference group ($b'_g < 0$). Thus, when the individual observes that his or her environment is filled with hard-working people the worker will be judged more if they "stick out" more relative to the performance of others. The individual may feel as if he or she is more negatively perceived if further down the ranking of work effort.

3. Results

After setting up the Lagrangian, taking the total differential of the first order conditions of (1) and performing comparative statics, we obtain for an individual (subscripts were dropped

for convenience of the presentation):

$$\frac{dh}{d\mu_h} = \frac{-b' s'}{bs''(h) + 2wu_{ch} - u_{hh} - w^2 u_{cc}} > 0 \quad (2)$$

with the partial derivatives of the private utility $u_{cc} < 0, u_{hh} < 0$.

Equation (2) shows that an increase in the average hours worked in the individual's reference group increases hours worked for the worker. The intuition is that when the average labor supply increases the parameter b increases and the social disutility increases so that total utility is lower. To find a new maximum total utility the worker increases hours worked; on the one hand utility decreases (because hours worked are a bad, $u_h < 0$), but on the other hand an increase in the labor supply reduces social disutility (because $s' < 0$). Overall, an increase in hours worked increases total utility because the decrease in social disutility is higher than decrease in individual utility. The model suggests that workers who are in an environment with a relatively high number of hard working people are induced to work more hours than when there is no social interactions effect present.

4. Conclusion

Our research uses a simple theoretical model of the labor supply that assumes social interactions in hours worked. We derive testable prediction that an increase in hours worked by the members of the reference group increases hours worked for the individual (endogenous social effect). The model provides context for several empirical results in the literature of labor supply with interdependence (Woittiez and Kapteyn 1998, Aronsson et al 1999, Grodner and Kniesner 2008b).

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