Journal of Economic Behavior & Organization 131 (2016) 166–182

Contents lists available at ScienceDirect

Journal of Economic Behavior & Organization

journal homepage: www.elsevier.com/locate/jebo

Looking after number two? Competition, cooperation and workplace interaction

Tim Barmby[a], John G. Sessions[b,*], Alexandros Zangelidis[a]

[a] Department of Economics, University of Aberdeen Business School, Edward Wright Building, Dunbar Street, Old Aberdeen, AB24 3QY, Scotland, United Kingdom
[b] Department of Economics, University of Bath, Bath, BA2 7AY, England, United Kingdom, and IZA

ARTICLE INFO

Article history:
Received 9 September 2014
Received in revised form 13 July 2016
Accepted 2 August 2016
Available online 16 August 2016

JEL classification:
J33
J41
J54

Keywords:
Absence
Worker interdependency

ABSTRACT

We look for cooperation in a real-world setting in which optometrists absent less frequently in two-chair than one-chair offices because of the externality such behavior imposes on their co-worker. We motivate our empirical analysis by developing a model of worker interdependence in which two workers can either compete or cooperate. We show that, relative to a single worker working in isolation, competition unequivocally increases absence whilst cooperation may increase or decrease absence. Our empirical analysis of a unique data set finds explicit support for cooperative behavior.

1. Introduction

Economists have traditionally modeled human behavior in terms of individual constrained maximization, saying relatively little about the effect of relationships between family, friends, neighbors and work colleagues. Such neglect perhaps reflected not an ignorance of the importance of such interactions, but rather an awareness of how difficult it is to model theoretically, and measure empirically, such phenomena. This reticence has, to some extent, dissipated in recent years with a flurry of work emerging on the relationship between social interaction and phenomena such as crime [Glaeseret al. (1996)], educational choices [Sacerdote (2001), Lalive and Cattaneo (2009)], school drop-out behavior [Evans et al. (1992)], labour supply [Rees et al. (2003), (Grodner and Kniesner (2006)], unemployment [Topa, 2001)], disability behavior [Rege et al. (2012)] and retirement [Duflo and Saez (2003)].

Of particular relevance to this study is the nascent body of work seeking evidence of cooperation in the workplace [see, for example, Bandiera et al. (2005, 2009, 2010, 2013), Carpenter and Seki (2011), Mas and Moretti (2009)].[1] We contribute to this literature by modeling and measuring the relationship between a very precise workplace interaction and outcome. Very few employees work in complete isolation and so one would expect employee-interaction to be important for many workplace decisions and, therefore by extension, the labour market equilibria that relate to those decisions. A prime example is absenteeism.

* Corresponding author.
E-mail addresses: tim.barmby@abdn.ac.uk (T. Barmby), j.g.sessions@bath.ac.uk (J.G. Sessions), a.zangelidis@abdn.ac.uk (A. Zangelidis).

[1] For a review of the literature examining field experiments both within and between firms, see Bandiera et al. (2011).

http://dx.doi.org/10.1016/j.jebo.2016.08.001

There is a small, but growing, literature examining worker-interaction and absenteeism see, for example, Ichino and Maggi (2000), Skåtun and Skåtun (2004). Heywood and Jirjahn (2004), Heywood et al. (2008), Barmby and Larguem (2009), Hesselius et al. (2009), Dale-Olsen et al. (2011)]. Most of this literature has, of necessity, tried to interpret data where the margin of interaction between workers is to a large extent unknown. In the real world setting we examine here, that of optometrist services, the margin is very clearly defined because of the nature in which the service is organized. Each firm (i.e. workplace) is staffed by either one or two optometrists. In the latter case the two workers are substitutes in production − the absence of one imposes a utility cost on the other who is expected to undertake additional work for no additional pay. By identifying such costs we are able to derive clear comparisons as regards absence behavior within single- and two-worker firms.

To motivate our empirical analysis we extend the theoretical framework developed in Barmby et al. (1994) – hereafter BST. BST focus on an atomistic worker whose health is represented by a continuous random variable, δ, and who absents if realized health is above some threshold level, $\tilde{\delta}$, determined by wages, sick pay and contracted working hours. In our extension, firms comprise two interdependent workers who either cooperate or compete with one another by maximizing joint or individual utility accordingly. We show that sickness absence decisions are strategic complements – the more likely worker 1 is to absent, the more likely will worker 2 call in sick since the latter's expected utility is increasing in worker 2′s health threshold (i.e. with the likelihood that worker 2 does not absent).

Within this extended framework we derive the equilibrium absence rates for three cases of interest – single-worker firm; two-worker non-cooperative firm; two-worker cooperative firm – and show that, relative to the single-worker optimum, non-cooperation implies a lower health threshold, and so higher absence, whilst cooperation yields either a higher or lower health threshold. Intuitively, if workers choose to maximize their own individual utility rather than the joint utility of themselves and their co-worker, then there will be inefficiently high absence due to the effort externality an absenting worker imposes on his non-absenting colleague. Cooperation internalizes this externality and permits an efficient level of absence to be reached.

Our empirical analysis of a unique data set suggests that absence is indeed lower when employees work in pairs rather than in isolation, a result that lends support for the cooperative equilibrium outcome in our theoretical model. Our study, thus, also contributes to the literature on absenteeism; by extending the framework of analysis beyond a single worker, and by showing that when absence causes negative externalities for co-workers, models that do not account for the existence of co-workers are misspecified.

The paper is set out as follows: Section 2 recapitulates the original BST contribution, which Section 3 then extends to a two-worker environment. Our empirical analysis is set out in Section 4 and final comments are collected in Section 5.

2. Single worker

To motivate our empirical analysis we follow BST in assuming that individual workers make utility maximizing absence decisions conditional on a realization of their state of health. BST models individuals as homogenous risk neutral utility maximizes endowed with a stock of time, T, which they allocate between work and leisure. Utility is an increasing function of income and leisure, with individuals attaching a weight to each depending upon some parameter, δ, representing their general level of health. We assume that δ is increasing in sickness and uniformly distributed over the unit interval, with individuals valuing non-market (i.e. leisure) time more as $\delta \to 1$.[2] Thus:

$$u = \left(1 - \delta\right) x + \delta l \tag{1}$$

where x (l) denotes income (leisure). Prospective workers sign enforceable employment contracts that specify a particular level of remuneration, w, in return for a particular supply of effort. Considerations as to the intensity or quality of effort are ignored and for simplicity productivity is construed by mere attendance. After the contract is signed, but before production commences, each worker realizes his state of health and makes an *ex post* utility maximizing decision as regards absence. This decision is derived from a discrete choice with workers comparing between the two alternative of absence, a, or non-absence, na, with the utility payoffs using the utility function in Eq. (1) given by:

$$u^{na} = \left(1 - \delta\right) w + \delta (T - h) \tag{2}$$

$$u^{a} = \left(1 - \delta\right) s + \delta T \tag{3}$$

where s denotes the (exogenous) level of sick pay and h denotes contractual hours. It is apparent that the relative magnitude of these payoffs depends on δ with the worker being indifferent between absence and non-absence at a critical level of health $\delta = \tilde{\delta}$ such that:

$$u^{na}\left(\tilde{\delta}\right) = \left(1 - \tilde{\delta}\right) w + \tilde{\delta}(T - h) = \left(1 - \tilde{\delta}\right) s + \tilde{\delta} T = u^{a}\left(\tilde{\delta}\right) \tag{4}$$

[2] We assume that δ is uniformly distributed over the unit interval to simplify exposition. We show in a series of appendices, however, that our results are invariant to any assumed single or joint distribution over δ.