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Gift giving and worker productivity: Evidence from a firm-level experiment ☆

Charles Bellemare [a,b,c,*], Bruce Shearer [a,b,c]

[a] *Département d'économique, Université Laval, Canada*
[b] *CIRPÉE, Canada*
[c] *IZA, Germany*

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ABSTRACT

We present results from a field experiment, designed to measure worker response to a monetary gift from their employer. The experiment took place inside a tree-planting firm paying its workforce incentive contracts. Firm managers told a crew of tree planters they would receive a pay raise for one day as a result of a surplus not attributable to past planting productivity. We compare planter productivity—the number of trees planted per day—on the day the gift was handed out with productivity on previous and subsequent days of planting on the same block, and thus under similar planting conditions. We find direct evidence that the gift had a significant and positive effect on daily planter productivity, controlling for planter-fixed effects, weather conditions and other random daily shocks.

1. Introduction

The modern economic theory of the firm emphasizes the role of labour as a unique factor of production. The recognition that workers can control their own productivity has led economic theorists to a detailed study of incentives, contracts and the internal worker-firm relationship; see, for example, Hart and Holmstrom (1987), Milgrom and Roberts (1992), Lazear (1998). One branch of this literature has concentrated on models of social interaction and gift exchange. The origins of these models can be traced to sociology and anthropology; see Mauss (1990) for a historical overview. Their theoretical foundations are based on the principle of reciprocity, stating that gifts received bring with them the obligation of returning gifts.[1] Economic interest in gift exchange derives from the possibility of its use as an effort-inducing device within firms (Akerlof, 1982). What is more, models of gift exchange have been shown to give rise to wage rigidity and involuntary unemployment (Akerlof, 1984), generating macroeconomic as well as microeconomic implications; see Fehr and Gächter (1998) for a review.

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* Corresponding author at: Université Laval, Département d'économique, Quebec, QC, Canada.
E-mail addresses: Charles.Bellemare@ecn.ulaval.ca (C. Bellemare), Bruce.Shearer@ecn.ulaval.ca (B. Shearer).

[1] An alternative interpretation is given by Carmichael and MacLeod (1997): gifts exchanged at the beginning of a long-term relationship may serve to support cooperation.

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Testing models of gift exchange is problematic using observational data. Many of the forcing variables that determine the response to the gift, such as effort costs and alternative wages, are unobservable. This has led many researchers to use laboratory experiments to evaluate these effects. The laboratory permits extensive control over the economic environment, allowing researchers to generate exogenous gifts and to observe participants' reaction to them. Many laboratory studies suggest that gifts in the form of increased wages are reciprocated by workers in the form of increased productivity (e.g., Fehr et al., 1993; Hannan et al., 2002; Charness, 2004).

One concern with laboratory experiments is generalizability. The laboratory may represent an artificial environment which affects participants' behaviour. An early example is the experiments conducted at the Hawthorne Works of the Western Electric Company (Gillespie, 1991). French (1953) suggested that field experiments would improve generalizability by allowing the observation of participants within a natural setting. Recent field experiments applied to (spot) labour markets have increased our understanding of the importance of gift-exchange in the real world. For example, Gneezy and List (2006) found that the effect of gifts on worker productivity quickly dissipated and was in some cases insignificant.[2]

However, the impact of gifts on worker productivity within real economic firms remains largely unknown. Firms often differ from spot markets by the presence of long-term employment relationships and repeated interaction (Simon, 1991) which can affect worker response to gifts. Akerlof (1982) emphasized the importance of repeated interaction in developing worker sentiment for the firm and utility from gift exchange.

In this paper, we present a first attempt to measure worker response to a monetary gift from their employer within a real economic firm. Our study is based on a field experiment, conducted within a tree-planting firm operating in British Columbia, Canada. Workers in this firm are typically paid piece rates and earn approximately $200 per day.

During the experiment workers received a surprise bonus of $80, in addition to their regular piece rate, for one day's planting. The bonus was formulated as a gift from the firm to the workers. Workers were told that extra money was available in the contract due to an exceptional event and that the firm had decided to distribute that money among the workers. We measure worker response in terms of their daily productivity—the number of trees planted.[3]

The experiment was conducted on a large homogeneous block of land permitting the observation of workers, with and without the bonus, under stable planting conditions. Eighteen planters took part in the experiment which took place in the early summer of 2006. The block was planted over a seven-day period and the bonus was paid on the second day of planting on the block. Each worker involved in the experiment is observed planting with and without the bonus. We use our panel data to estimate the effect of the gift on planter productivity, controlling for planter-fixed effects, weather conditions, and other random daily shocks. Our results show that workers responded positively to the gift by increasing their average daily production by 118 trees, approximately 10 percent.

To control for day-of-the-week effects (possibly due to fatigue), we expanded our data set to include information on the daily productivity of the experimental participants over a period of six weeks. This combined data set allowed us to identify the effect of the gift by comparing average productivity on the day of the gift with average productivity both on and off the experimental block, and within and outside of the experimental week. Again, we find that the gift significantly raised average daily planter productivity, by 132 trees, an estimate comparable to that obtained using information on the experimental block alone.

Our results also suggest that worker response is significantly correlated with tenure in the firm. High-tenure workers typically respond more to the gift than do low-tenure workers. Moreover, 14 of the 18 planters who participated in the experiment are predicted to respond significantly to the gift.

The rest of the paper is organized as follows. In the next section we present institutional details of the tree-planting industry and the firm in which the experiment took place. Section 3 presents the design of the experiment. Section 4 presents the data analysis. Section 5 presents our results and Section 6 concludes.

2. Tree planting in British Columbia

2.1. The industry

Tree planting is a simple, yet physically exhausting, task. It involves digging a hole with a special shovel, placing a seedling in this hole, and then covering its roots with soil, ensuring that the tree is upright and that the roots are fully covered. The amount of effort required to perform the task depends on the terrain on which the planting is done and weather conditions. Flat plateaux are much easier to plant than steep mountain sides and hard, rocky soil is more difficult to plant than soft terrain. British Columbia is a very mountainous region of Canada; the terrain can vary a great deal from site to site.

[2] See also Kube et al. (2006). Falk (2007) on the other hand finds significant field evidence of gift exchange in the context of charitable giving.

[3] These workers do not perform any other task apart from planting trees. Hence, the number of trees planted accurately summarizes worker daily productivity.