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The labor supply of fixed-wage workers: Estimates from a real effort experiment ☆

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ABSTRACT

Fixed-wage workers comprise the bulk of the labor force and yet little is known about how they respond to changes in their wage. Given recent interest in theories of reciprocity and intrinsic motivation and their implications for effort provision, the neoclassical prediction seems less obvious today. To better understand the motivation of these workers, I estimate their labor supply using a real effort experiment. Two results stand out. First, no one theory seems to fit the pooled data. On average, people work considerably harder than the minimum but they do not respond to changes in the wage. Second, pooling the data is deceptive because there seem to be distinct types with differing responses to the wage. Most workers can be classified as reciprocal or intrinsically motivated and, indeed, these types respond as theory would predict: reciprocators return wage gifts with increased effort and extrinsic incentives crowd out motivation for intrinsic workers.

1. Introduction

The study of labor supply is foundational within economics - the relationship between the wages offered by firms and the effort provided by workers forms the basis for public policy debates that inform the evaluation of tax and welfare programs and the design of labor market interventions. Concomitant with the importance of this relationship, the literature offering estimates of labor supply is vast and considers many important differences such as those in worker characteristics (e.g., union status, gender), in sectors (e.g., private versus public) and in compensation schemes (e.g., performance pay and group incentives) to mention just a few (Ashenfelter and Layard, 1986; Ashenfelter and Card, 1999). I focus on two aspects of the labor contract that determine the working conditions for a large, but understudied, portion of the labor force, namely the labor supply of unmonitored fixed-wage workers. Indeed, surveys suggest that despite an increase in the use of performance pay for executives, most non-exempt salaried or hourly employees, perhaps the bulk of the labor force, continue to work without performance incentives (Ledford, 2014). These employees are paid a simple fixed wage (per annum or per hour) with no bonus, piece rate or profit-sharing and although they may not have much choice over how long they must be at work, they do have considerable latitude in determining how hard to work (Hamermesh and Wolfe, 1990).

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In this setting the boss cannot contract for an effort level and therefore the predictions of static principal-agent theory seem straightforward: because workers receive the fixed wage regardless of their performance, if effort is costly they should not work very hard, i.e., they should "shirk" (Akerlof, 1982; Bowles, 1985). As a result, the neoclassical theory predicts that effort will fall to some minimum and should be invariant to changes in the fixed wage. However, only the prediction that effort should not respond to changes in the fixed wage is crisp. Though the focus here is on unsupervised workers, if some form of monitoring is available to the principal, effort can be sustained by threatening to fire workers earning greater than the market wage when they are caught shirking (Shapiro and Stiglitz, 1984). However even without monitoring, the situation on which we focus, if workers eschew extrinsic rewards and yet are intrinsically motivated to provide some "whistle while you work" level of effort (a la Deci and Ryan, 1985), they may work considerably more than the minimum. That said there is no reason to believe that intrinsically motivated workers will increase their efforts when the fixed payment is raised (Benabou and Tirole, 2003).

Based on the reciprocal nature of workers, Akerlof (1982) proposes an alternative prediction for this setting, one in which workers repay higher than equilibrium wage "gifts" by working more than the minimum. In particular, the posited effort norm governing worker reciprocity is increasing in the firms' wage (relative, perhaps, to some "fair" reference wage) and so the larger the wage rent, the harder the employee should work This logic suggests a labor supply curve that will be upward sloping in the standard absence of income effects.

Perhaps because it is easier to observe whether or not a worker turns up to the job than exactly how much effort a worker provides, most empirical work on labor supply analyzes the extensive margin. Despite the imbalance in empirical work based on observational data, the theoretical literature analyzing the intensive margin is rich and there have been a few more recent studies focussing on how hard people work in response to changes in their pay. For example, labor supply estimates of fixed-wage workers based on observational data have exploited changes in the tax code (Keane, 2011) or other legislative interventions that affect salaries (e.g., Fisman et al., 2012). The typical finding is that the elasticity of labor supply is relatively low despite upward bias resulting from confounding effects on the extensive margin (Heckman, 1993).

In addition to the problems of identifying the effect of wage changes on the intensive margin, observational studies suffer from other selection issues and the bias associated with important unobservables. With this in mind, a number of careful case studies and field experiments have been conducted recently. For example, Oettinger (1999) estimates the labor supply of stadium vendors, Camerer et al. (1997), Crawford and Ming (2011) and Farber (in press) all examine taxi drivers, Fehr and Goette (2007) study bicycle messengers and Bellemare and Shearer (2011) study labor supply effects among tree planters. Though tempting to do so, it is hard to make comparisons between these innovative studies and the experiment described below because workers in these studies are all offered performance incentives, not fixed wages. Likewise, in the experimental lab, labor supply estimates based on real effort tend to rely on piece rate employment contracts (e.g., Swenson, 1988; Dickinson, 1999; Sillamaa, 1999, Huet-Vaughn, 2015) and are therefore also not directly comparable.

Considering real effort experiments that are more similar because they use fixed-wage contracts, Gneezy and List (2006), Kube et al. (2012), Esteves-Sorenson and Macera (2013) and Gilchrist et al. (in press) all conduct gift exchange experiments with people hired for short term jobs. Among library workers and donation solicitors, Gneezy and List (2006) confirm gift exchange in the short term. Within 90 min of the start of a day's work, output is greater for those paid a high fixed wage compared to those paid a low wage but the effect fades. Also utilizing temporary library workers, Kube et al. (2012) show that worker reciprocity is stronger when the gifts take a non-monetary form. Esteves-Sorenson and Macera (2013) hire undergraduates to do a data entry task over three (weekly) shifts, changing their fixed wage once, twice or not at all, and find little evidence of gift exchange, despite the wage increments being designed to be perceived as gifts. Contrary to the previous paper, when Gilchrist et al. (in press) attempt to make a wage gift more obvious, they have more success in eliciting greater effort. While potentially illustrative of worker motivation, these studies were not designed to estimate labor supply and it is hard to make any inferences based on just two wage treatments.

To identify the labor supply of unmonitored fixed-wage workers, I conduct a similar experiment to those just mentioned in that workers are hired for a one-time job doing clerical work. The benefit of one-time employment is that our estimates will not be confounded by repeated game or reputational effects. What is different, however, is that workers in this study are randomly assigned to one of five wage treatments, including wages at and on either side of a standard (reference) wage for this type of work. In addition, workers fill out a survey including a standard personality scale and a few other attitudinal questions.

Overall, I find that the employees do a considerable amount of work in contrast to the neoclassical prediction but that labor supply is, on average, inelastic and slightly downward sloping, though not significantly so. What makes the point estimates negative is a unique aspect of the design, namely that workers are unpaid volunteers in one of the treatments and it appears that financial compensation crowds out intrinsic motivation, to some extent. While this fact is consistent with the literature on intrinsic motivation, the fall off from the volunteer condition is not dramatic in the pooled data. At the same time, because labor supply is essentially flat, at first blush we find little evidence of gift exchange.

However, digging a bit deeper, it appears that the response to the wage treatments is heterogeneous. While personality attributes appear to matter little, a question designed to measure the extent to which workers subscribe to reciprocity norms bifurcates our sample. Those who subscribe to the norm of "returning favors" behave very differently from those who do not. Indeed, there appear to be two clear types of workers: reciprocators whose labor supply is upward sloping through the reference wage and those who appear intrinsically motivated (confirmed by a standard question from an intrinsic motivation inventory). This second group of employees works considerably harder as volunteers than when they are paid.