



## Information transparency, fairness and labor market efficiency



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### ABSTRACT

We study the role of information transparency on fairness, welfare and efficiency in long-term employment relationships. When information on the firms' productivity and surplus is revealed, wage offers represent larger shares of potential gains for workers who, in return, respond with higher performance. Workers respond not only to wages, but also to firms' intentions concerning fairness. We find that, in long-term relationships, transparency is a strong mechanism to promote performance and welfare. It naturally improves relationships between firms and workers, increases workers' welfare, profits from low productivity jobs and boosts the labor market efficiency.

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### 1. Introduction

Recently, a handful of firms and startups (e.g. Whole Foods, Buffer, SumAll) reportedly initiated an open book strategy through which they reveal everybody's salaries, instead of leaving their workers in the dark (Nisen, 2013, Weismann, 2014). One company also revealed each investor's share with a fully available capital structure. According to the claims made by these companies, information transparency increased performance in the workplace significantly by creating a more trusting environment.

These examples provide motivation for our study. We use experimental methods to analyze the role of information transparency in long-term employment relationships. Our focus is on how transparency affects the choices of firms and workers, and whether it leads to efficiency and welfare gains.

The key finding of this study is that information transparency serves as an effective mechanism to improve the worker's welfare and the market efficiency, while increasing the firm's profits from low productivity jobs. In long-term employment relationships, where repeated interactions and reputation remedy market inefficiencies to some degree, we find that revealing information strongly improves the total surplus.

When workers are fully informed about the productivity levels and potential profits of their firms, firms propose higher wages and workers respond with high effort levels. The workers response to a dollar increase in the wage is not constant and depends on the

following factors. First of all, it is elevated with information transparency. That is, a dollar increase in the wage extracts more efforts when the worker is fully informed. Secondly, it depends on whether a wage offer represents a larger or potentially a fairer share of the final surplus for the worker.

The definition of "fairness" is based on the behavioral and experimental paradigm by Ernst Fehr and his coauthors (Fehr et al. (1999) and Brown et al. (2004) are some of the best known of this work). The models of fairness assume that there are fair-minded workers who adjust their behavior in the following manner: If the wage offer potentially represents an equal division of surplus, the fair-minded worker will react by supplying high effort to support that outcome. Otherwise, she will simply not be happy and reduce her effort. Thus, there is continuity in the worker's reaction to wage offers. Preferences for fairness do not imply blindly choosing the outcome where the surplus is split 50%-50%. Instead, these preferences are "focal", i.e. the worker focuses on what the wage offer represents.

This paper contributes to the behavioral account of labor markets in a few different ways. First, our findings are in line with much experimental evidence that an increase in the wage improves performance. Second and most important, information transparency promotes wages and increases the workers' effort; hence it increases the average payoffs for workers, average profits from low productivity jobs for firms (without hurting profits from higher productivity jobs), and the size of the total surplus.

Hennig-Schmidt et al. (2010) argue that the employer's surplus information is crucial for a positive wage–effort relationship in one-shot interactions. With this paper, we suggest that in repeated interactions too, information transparency is a strong mechanism to promote fairness, performance and welfare. It naturally and quickly

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improves relationships between workers and firms; hence considerably raises the labor market efficiency.

We find that workers reciprocate to a dollar increase more, if they know that their jobs have low productivity. Similarly, Gose et al. (2012) show that workers' response to a dollar is not standard; and that they exert more effort per dollar wage, when employers face the risk of losing money. Thus, it is important to recognize the power of information transparency on the firm's finances and that it may be desirable by both sides of the market.

Complete information transparency is a major revision to conventional business practices. But workers who respond to "fairness" would also respond to information transparency and potentially select into an open book firm. This can be crucial especially for small firms, since it attracts a team of loyal and hardworking employees who reciprocate to a dollar pay increase with higher performance.

We believe more firms should consider revealing their finances in the light of recent experimental and field evidence. Regulations towards income transparency, especially for small-sized firms, can be very effective in increasing everyone's payoff and market efficiency. Alternatively, workers (or their unions) may try to convince their firms to reveal information on productivity and profits, as this may highly benefit both parties.

## 2. Experimental approach to labor relationships

Many theories of fairness, inequity aversion and reciprocity have been offered to explain the firm and the worker behavior. Well-documented evidence from laboratory and field experiments confirms the existence of behavioral motives in labor market decisions. However, the role of information transparency has yet to be explored in detail.

In this paper, we consider a setup which is applicable in a broad range of market scenarios. Firms and workers sign incomplete contracts and interact repeatedly. There are more workers than jobs, thus the competitive equilibrium prediction is for the wage to equal the opportunity cost of workers. Likewise, there is no incentive, in a one shot game, for workers to exert more than the minimal effort, because any additional effort only decreases the worker's share of the surplus (since his share is the fixed wage he already accepted), while increased effort only increases the firm's share. However, several stylized and empirical facts about labor relationships are at odds with this view. What is observed is that the wages tend to be above the opportunity cost of workers, and effort levels tend to be increasing in the level of wage offers. One interpretation is that workers are concerned about the "fairness" of any given wage offer. This is the fairness version of the efficiency wage hypothesis (Akerlof and George, 1982; Akerlof et al., 1990). Fairness is usually interpreted as "equal shares," which is a natural focal point in an experiment where roles are chosen randomly and there is no compelling reason why either side would be entitled to a larger share than the other.

The idea that workers respond to efficiency wages is well understood. According to the fair-wage effort hypothesis, workers compare wages with what they think is fair before making an effort choice. Models of reciprocity and inequity aversion explain deviations from the standard labor market predictions (e.g. Fehr et al., 1999; Bolton et al., 2000; Charness et al., 2002; Dufwenberg et al., 2004). Meanwhile laboratory and field experiments largely support the claims of behavioral economic theory (e.g. Fehr et al. 1993, 1996, 2000).

It is established that preferences for fairness are present in labor relations and that fairness serves as an incentive mechanism for workers to perform well (see Falk et al., 2008). The inequity aversion model by Fehr et al. (1999) has been the framework for most experiments. The model is simply based on the idea that there are both selfish and fair-minded workers in the labor market. Fair-minded workers respond to generous offers with a generous effort level, thus firms have an incentive to offer rents even in one-shot interactions. But,

the importance of fairness is amplified in repeated settings. Contractual incompleteness implies rewards and punishments in future periods and gives rise to "relational contracts" which are self-enforcing in nature (MacLeod et al., 1989). Since renegotiation and reputation become a concern, selfish workers have an incentive to mimic fair-minded workers and supply high effort levels when offered a generous wage. The presence of fair-minded workers also guarantees that greedy offers are penalized with low effort levels. Ultimately, the interaction between fairness concerns and repeated game incentives result in an outcome that involves non-minimal wage and effort, and significant surplus sharing (Brown et al., 2004).

The gift-exchange setup has been widely used to examine the performance effects of fairness (e.g. Hannan et al. (2002), Brandts et al. (2004)). In a typical gift exchange experiment, the ordering of events is as follows: The firm proposes a fixed wage to be paid, but does not enforce a performance level on the worker; then the worker chooses an effort level which determines the firm's and her final payoffs. In this paper, we extend this paradigm in a few more directions. First, we focus on long-term contracting by allowing employers to make offers to specific workers in a private fashion (similar to Brown et al. (2004)). Second, we introduce heterogeneity in the following sense: firms have multiple jobs with different productivity levels, i.e. at given effort levels some jobs are more productive or more profitable than others. Third and most important, we introduce the following information problem to the design: when the market is completely transparent, workers are fully informed about the exact productivity of their jobs, thus, they know the size of the potential final surplus and profits for their firms before making an effort decision; however, in the absence of transparency, workers are left in the dark about the total surplus created as a result of their efforts.

The difference between these two hypothetical states (full information and limited information) summarizes the role of information on employment relations, fairness and efficiency. It is impossible to find naturally occurring data to fit into this setup. However, experimental methods permit exogenous variations in the information structure.

Transparency has been shown to improve the labor market efficiency in one-shot interactions (e.g. Irlenbusch et al. (2005), Hennig-Schmidt et al. (2010)). Hennig-Schmidt et al. (2010) study the role of information about peer wages and the employers surplus on work performance. The authors report that full information on mutual surplus is necessary for a positive wage–effort relationship. Finally, Gose et al. (2012) find that when firms carry the risk of losing money, they offer lower wages. But workers supply more effort per dollar, since a dollar increase shows more trust by a firm which is in danger of losing money.

In this paper, we analyze the impacts of information transparency in long-term employment relationships where jobs are heterogeneous in productivity. This allows us to study the firm's wage choices and the worker's performance in low, medium and high productivity jobs with and without full information in repeated interactions.

## 3. Experiment design

A total of 104 subjects participated in eight sessions. Each session included 18 periods with 3 firms and 10 workers. The sessions were conducted in Gregory Wachtler Experimental Economics Laboratory at Rutgers University in New Brunswick, NJ. Subjects were seated in cubicles with computers connected to each other by z-Tree experimental software (Fischbacher and Urs, 2007). A typical session took an hour and a half, and the average payment was approximately \$20.

In a given session, three participants were assigned the role of an individual firm and 10 were assigned the role of a worker; these roles remained the same throughout the session. The program assigned each firm and each worker an identification number which was fixed throughout the session. Thus, the workers were able to

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