Journal of Economic Behavior & Organization 68 (2008) 412–421

Contents lists available at ScienceDirect

Journal of Economic Behavior & Organization

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

Performance-pay, sorting and social motivation

Tor Eriksson[a,1], Marie Claire Villeval[b,c,d,*]

[a] Aarhus School of Business, Aarhus University, Department of Economics and Center for Corporate Performance, Prismet, Silkeborgvej 2, 8000 Aarhus C, Denmark
[b] CNRS, GATE, Ecully, F-69130, France
[c] University of Lyon, Lyon, F-69007, France
[d] IZA, Bonn, D-53113, Germany

ARTICLE INFO

Article history:
Received 3 May 2005
Accepted 14 October 2007
Available online 21 June 2008

JEL classification:
M52
J33
J31
C91

Keywords:
Performance-pay
Incentives
Sorting
Social motivation
Experiment

ABSTRACT

Variable pay links pay and performance but may also help firms to attract more productive employees. Our experiment investigates the impact of performance-pay on both incentives and sorting and analyzes the influence of repeated interactions between firms and employees on these effects. We show that (i) the opportunity to switch from a fixed wage to variable pay scheme increases the average effort level and its variance, and (ii) high skill employees concentrate under the variable pay scheme; (iii) however, in repeated interactions, efficiency wages reduce the attraction of performance-pay. Social motivation and reputation influence both the provision of incentives and their sorting effect.

1. Introduction

In the last two decades the prevalence of different forms of variable pay has increased substantially in many firms and countries. Variable pay schemes are typically motivated by the incentive effect they exert on the employees by linking pay to performance. It is, however, frequently forgotten that performance-related pay may also help firms to attract the most productive employees and weed out the less productive ones. In contrast, fixed pay schemes not only have less incentive power, but they are also less able to sort employees since they are usually implemented when it is difficult and costly to measure individual performance. If this self-sorting effect is not accounted for, the higher efficiency observed when comparing a piece-rate compensation scheme relative to an hourly wage scheme may be unduly attributed to the incentive effect of the variable wage; see Lazear (2005). The sorting effect arises for two reasons. Highly productive employees will prefer performance-pay to hourly or monthly pay in as much as they know that their productivity is higher than that of the other employees in the firm. Thus, performance-pay enables them to increase their income from work, whereas the less productive employees will tend to quit or avoid joining firms that use performance-pay schemes because such arrangements are not attractive to them.

* Corresponding author at: GATE-CNRS, 93, chemin des Mouilles F-69130 Ecully, France. Tel.: +33 4 7286 6079; fax: +33 4 7286 6090.
E-mail addresses: tor@asb.dk (T. Eriksson), villeval@gate.cnrs.fr (M.C. Villeval).
[1] Tel.: +45 8948 6404; fax: +45 8948 6197.

0167-2681/$ – see front matter
doi:10.1016/j.jebo.2007.10.003

A first aim of this paper is to report the results of a laboratory experiment designed to investigate the incentive and the sorting effects of performance-pay by studying how the employees self-select their incentive scheme and choose their level of effort. This is motivated by the fact that due to dearth of natural data, the distinction between the selection and incentive effects of pay schemes cannot be easily documented empirically. As regards the incentive effect of performance-pay, one strand of the literature emphasizes the repetitive game nature of employment contracts (see Malcomson, 1999 for a survey), labor market conditions (MacLeod and Parent, 1999), or competition in the product market (Bertrand, 2004). Thus far, only a few studies have tried to identify a sorting effect of performance-pay distinct from its incentive effect.[2] The best way to isolate the two effects is to use personnel files of firms that have changed their compensation schemes. This has been done in a widely cited econometric case-study of the Safelite Company by Lazear (2000, 2005). Barro and Beaulieu (2003) study a large hospital company that switched from a salary to a profit-sharing plan compensation, and they also find increases in output as well as selection effects. However, following the strategy in Lazear (2000) is, in most cases, difficult as the switch from one compensation scheme to another can only rarely be considered as exogenous and finding good instruments for the choice of compensation scheme is extremely difficult. An additional problem is finding data on individual performance under both fixed wage and variable wage schemes.[3] Experimental methods may help to circumvent some of these difficulties by guaranteeing the exogeneity of the introduction of performance-pay. The relationship between risk attitude and sorting has been recently documented by means of field experiments (Bellemare and Shearer, 2006) and laboratory experiments in which employees can choose between various payment schemes (Dohmen and Falk, 2006; Cadsby et al., 2007; Eriksson et al., 2008).

The laboratory experiment presented in this paper has been designed to test the key predictions derived from Lazear's (2000) model in a framework in which effort is observable but not contractible and in which the risk attitude of employees cannot play any role. The observability of effort would of course influence the offer of the payment scheme by the employers, but here we are interested in the selection made by the employees. The predictions are the following: (i) a switch from a fixed to a variable wage increases the average level of effort, (ii) introducing the possibility for the employees to move to a variable wage scheme increases the variance in effort, (iii) the gain in productivity is due to both an incentive effect and a sorting effect, and (iv) the possibility to choose between a fixed wage and a variable pay leads to a segmentation of the labor market with high skill employees concentrated in the performance-pay firms and low skill employees populating the fixed-pay firms. Our experimental methodology provides an opportunity to observe the incentive and sorting effects when both a fixed wage and a variable reward system are available to the employees. It both allows us to control the environment (skill levels, structure of pay) and provides unbiased measures of the agents' productivity and mobility.

This experiment also accounts for the observation that employment relationships usually are long-term relationships. Repeated interactions frequently involve social motivation that could influence both the incentive and the sorting effects of pay schemes. In repeated games where reputation building may occur, the interaction of reciprocally motivated subjects and selfish subjects may lead to the enforcement of labor contracts even in the absence of a formal incentive system (Falk et al., 1999; Fehr et al., 1997). In such a context, the introduction of explicit (positive or negative) incentives may even crowd out voluntary cooperation (Frey and Oberholzer-Gee, 1997; Gneezy and Rustichini, 2000; Houser et al., 2008; Dickinson and Villeval, 2008). Therefore, we test the additional hypothesis that (v) when interactions are repeated, the difference between the fixed and the variable pay schemes in terms of incentive provision and sorting is weakened. Indeed, a generous (non-equilibrium) fixed wage might also be able to attract skilled employees and reciprocity might motivate them to work hard.

Our experiment involves firms and workers with two possible skill levels who have an opportunity to contract and work under different pay schemes. It consists of two treatments, a "fixed wage" treatment and a "menu" treatment. Two conditions have been implemented, a "market" condition and a "partner matching" condition, which are intended to represent a spot labor market and a long-term employment relationship respectively. Under the market condition, we implement a fixed wage treatment in the first part of the sessions. Each firm posts its fixed wage offer. Each worker then successively chooses an offer and decides on her actual level of effort. In the second part of the sessions, we implement the menu treatment in which the firm offers both a fixed pay and a variable pay scheme in which the wage increases in the *ex post* level of effort. Under the partner matching condition, the only difference is that pairs are fixed throughout the session.

Our findings support the hypotheses mentioned above. Under the market condition, when a variable pay scheme becomes available, the average effort as well as its variance increase substantially compared to the situation where a fixed wage is imposed. The increase arises mainly because the high skill employees select the variable pay scheme as they can improve their payoff by exerting a higher effort. As a consequence, the labor market becomes segmented with the low skill employees remaining in fixed pay firms and most high skill employees working under a variable pay scheme and putting forth high effort. In the repeated interaction game, however, and relative to the market condition, most firms offer higher fixed wages, workers exert a higher average effort under the fixed pay scheme, and the high skill employees are less inclined to switch to

[2] Most studies of the consequences of changes in reward systems focus exclusively on incentive effects; see Freeman and Kleiner (2005), Paarsch and Shearer (1999), and Nagin et al. (2002).

[3] Parent (1997) shows, from individual data, that piece-rate pay is associated with an incentive effect whereas bonuses are more related to a sorting effect. A limitation is however that the data do not inform about the proportion of the wage that is variable. Booth and Frank (1999) make use of panel data on individuals to control for both observable worker characteristics and unobservable heterogeneity, but no direct measure of productivity is available.