



## Performance pay, risk attitudes and job satisfaction

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### ABSTRACT

We present a model in which workers with greater ability and greater risk tolerance move into performance pay jobs to capture rents and contrast it with the classic agency model. Estimates from the German Socio-Economic Panel confirm testable implications drawn from our model. First, before controlling for earnings, workers in performance pay jobs have higher job satisfaction, a proxy for on-the-job utility. Second, after controlling for earnings, workers in jobs with performance pay have the same job satisfaction as those not in such jobs. Third, those workers in performance pay jobs who have greater risk tolerance routinely report greater job satisfaction. While these findings support models in which workers capture rent, they would not be suggested by the classic agency model.

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### 1. Introduction

Performance pay has been shown to increase worker effort, earnings and risk (Booth and Frank, 1999; Lazear, 2000; Lemieux et al., 2009; Oettinger, 2001; Paarsch and Shearer, 2000; Parent, 1999; Shearer, 2004). Yet, distinguishing between competing models of performance pay depends on identifying the influence of performance pay on job satisfaction – something that has not been widely recognized in the existing literature. In the classic agency model of performance pay, the principal has full bargaining power. Facing a reservation utility constraint, she sets the earnings contract to just offset effort and risk costs (e.g., Holmstrom and Milgrom, 1987; Gibbons, 1998). This exact offset implies that performance pay should not influence job satisfaction. In contrast, Lazear (1986) models performance pay as a self-sorting process by workers of heterogeneous abilities. Firms face a zero profit market constraint allowing workers to capture the rent associated with their ability by sorting into performance pay. The rent capture implies that performance pay should generate greater job satisfaction. Thus, a careful examination of job satisfaction may suggest the extent of rent capture and so the

relative importance of the classic agency and sorting models of performance pay.

We extend the sorting models of Lazear (1986) and Booth and Frank (1999) to account for heterogeneity in both ability and risk attitudes. While standard agency analyses are limited to risk averse workers, our model allows risk neutral and risk loving workers. Our sorting model predicts that the more able and more risk tolerant sort themselves into performance pay schemes in order to capture rents and that this increases their on-the-job utility. Moreover, the two critical sorting dimensions interact. Capturing the rent on ability requires sorting into the performance pay sector and among those sorting into performance pay, workers with the greatest risk tolerance will receive the greatest on-the-job utility.<sup>1</sup> Among those remaining in the time rate sector, there should be no relationship between risk tolerance and utility. Finally, the model presents ambiguous predictions as to whether or not workers on performance pay will continue to receive greater utility once the positive influence of higher earnings is removed. However, the positive relationship between risk tolerance and utility for those on performance pay should remain independent of the influence of higher earnings.

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<sup>1</sup> Indeed, the US business press suggests that workers searching for a job and sure of their ability can increase the odds of getting the job by negotiating a higher proportion of incentive pay to base pay (Fisher, 2004).

The empirical testing exploits a unique question on risk tolerance in the German Socio-Economic Panel (GSOEP). Using job satisfaction as an indicator for on-the-job utility, we confirm each of the predictions of our sorting model. Performance pay emerges as a positive determinant of job satisfaction. Among those receiving performance pay, greater risk tolerance is associated with greater satisfaction whereas risk tolerance plays no role in job satisfaction among those on time rates. Finally, controlling for earnings causes the coefficient on performance pay to move to statistical insignificance while it does not change the link between risk tolerance and job satisfaction. These results hold in robustness checks that control for an expanded range of ability correlates and that account for worker specific fixed effects generated from a panel earnings regression. They also persist in explorative instrumental variable estimates accounting for the possible endogeneity of performance pay.

While these findings fit the predictions of our sorting model, they are not easily reconciled with the standard agency model. As the principal sets earnings just to offset effort and risk costs, the classical agency model predicts that performance pay should not influence job satisfaction and that after earnings are controlled for, job satisfaction should be lower in the performance pay sector than in the time rate sector. Moreover, the typical agency model predicts that there should be no relationship between risk attitude and job satisfaction in the performance pay sector. If a worker has a lower degree of risk aversion, the employer reduces the earnings premium that compensates for the disutility of bearing an income risk.

The next section sets the context by briefly examining past research and isolating our area of interest and value added. The third section details our extension of the sorting model in which workers sort on both ability and risk preferences. It draws predictions and testable hypotheses. The fourth section presents our data and variables while the fifth section presents the estimation results. A sixth section discusses robustness checks and a final section draws conclusions.

## 2. Past Research: setting the context

Economists have dramatically increased the number of studies estimating the determinants of job satisfaction. At the start of the 1980s [Bartel \(1981\)](#) found only a handful of studies of job satisfaction by economists but more than 3500 by other social scientists. Yet, [Hamermesh \(2004\)](#) emphasizes that the recent entry of economists into the field will not bring value if it only means examining explanatory variables with greater statistical sophistication. Instead, he calls for economists to use job satisfaction measures to test theoretical predictions about worker behaviour and/or labor market functioning. In taking this call seriously, we note that at its best job satisfaction approaches a measure of on-the-job utility. As [Hamermesh \(2001, p. 2\)](#) puts it job satisfaction is the only measure “that might be viewed as reflecting how (workers) react to the entire panoply of job characteristics” and as such “it can be viewed as a single metric that allows the worker to compare the current job to other labor market opportunities.”

We make use of job satisfaction to differentiate two polar models of performance pay. Focusing on the risk imposed by performance pay, the classic model of agency involves the trade-off between incentives and insurance ([Prendergast, 2000](#)). While the firm can increase effort through performance pay, it must compensate risk averse workers for the greater earnings risk. In designing performance pay, competition in the labor market generates a reservation utility constraint that the firm builds into its optimization. By implication, on-the-job utility (job satisfaction) is identical for a workers receiving performance pay and receiving time rates.

The alternative sorting model assumes that competition between firms drives economic profits to zero. Firms use performance pay to cause more able workers to sort into performance pay schemes ([Lazear, 1986; Booth and Frank, 1999](#)). Thus, in the classic windshield

study half of the productivity increase associated with initiating a piece rate came from more productive workers being attracted into the scheme ([Lazear, 2000](#)). Similarly, [Sorensen and Grytten \(2003\)](#) find that fully a third of the productivity increase associated with performance pay among Norwegian physicians is due to sorting. Further, [Curme and Stefanec \(2007\)](#) show that workers on performance pay have higher ability (AFQT scores), higher self-esteem and less fatalistic attitudes than do those on time rates.<sup>2</sup> This is critical as [Bowles et al. \(2001\)](#) show that each of these characteristics correlate with higher effort and greater earnings. Experiments confirm that those with higher ability and more confidence tend to choose a performance pay scheme in the laboratory ([Dohmen and Falk, 2006](#)). In this strand of literature, workers who sort into performance pay capture a rent associated with their ability.

We add to the self-sorting model by reintroducing the issue of risk. Yet, in the flavor of the sorting model, we allow for heterogeneous risk preferences. Thus, we reproduce the result that the more able sort into performance pay to capture rents but match it with the prediction that the more risk tolerant also sort into performance pay to capture rents. The expectation of sorting on risk has recently received empirical support by [Cadsby et al. \(2007\)](#). Using a real-effort laboratory experiment, they show that more risk-averse individuals are less likely to select pay for performance. Similarly, [Bellemare and Shearer \(2006\)](#) find in a field experiment that workers on piece rates in a tree-planting firm exhibit higher risk tolerance than individuals representing broader populations. More generally [Grund and Sliwka \(2010\)](#) use the GSOEP to confirm that greater risk tolerance stands as a positive determinant of receiving performance pay. However, [Grund and Sliwka \(2006\)](#) use a standard agency model to explain their finding without testing if the assumptions of that model hold.<sup>3</sup> They do not examine whether the sorting simply allows the principal to make smaller compensating earnings payments to those receiving performance pay because they are not as risk averse as the population in general or whether the sorting allows workers with less risk aversion to capture a portion of the associated rents.

While we are the first to use job satisfaction as a critical variable in thinking about the consequences of sorting and agency, we are not the first to examine performance pay schemes as a determinant of job satisfaction. Researchers in human resource management recognize that the structure, transparency and perceived fairness of a performance pay scheme will influence measures of job satisfaction ([Miceli and Mulvey, 2000; Brown, 2001](#)). Moreover, it has been thought that workers prefer employment environments that reward their productivity and that such environments are associated with increased worker optimism and satisfaction ([Brown and Sessions, 2003](#)). In addition, a few empirical studies by economists estimate the direct link between performance pay and job satisfaction. [Drago et al. \(1992\)](#) use Australian data to confirm that individual and group bonuses are positive determinants of job satisfaction even after controlling for earnings. [Heywood and Wei \(2006\)](#) examine US data finding that while performance pay in general tends to be associated with increased satisfaction, it is not uniform across the variety of types of performance pay. [McCausland et al. \(2005\)](#) use data from the British Household Panel Study (BHPS) showing that the influence of performance pay tends to increase satisfaction for the more highly paid but reduce it for the less highly paid. Both [Green and Heywood \(2008\)](#) and [Pouliakas and Theodossiou \(2009\)](#) use the BHPS to control for individual fixed effects with the former finding a positive influence

<sup>2</sup> Such results present a contrast to the notion that extrinsic rewards crowd out intrinsic motivation and lower worker self-esteem ([Frey, 1993; Benabou and Tirole, 2003](#)).

<sup>3</sup> Similarly, [Serfes \(2005\)](#) and [Wright \(2004\)](#) use the classic agency model to develop [Akerberg and Botticini's \(2002\)](#) hypothesis that less risk averse managers are hired by firms operating in more risky environments. [Wright \(2004\)](#) notes that in the matching equilibrium less risk-averse workers receive a rent if manager type and firm type are unobservable.

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