Gaming and Stochastic Contracts: Experimental Evidence

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It is by now well understood that very clear incentive schemes can induce gaming: the exploitation of a scheme by an agent for his own self-interest, to the detriment of the objective of the scheme. Ederer, Holden, and Meyer (EHM, *Rand Journal*, 2018, paper) showed theoretically in a two-task moral hazard model with privately known agent preferences that keeping an agent uncertain about the precise form of the reward scheme can mitigate gaming, which in that context takes the form of socially inefficient focusing of effort on the agent's privately-preferred task. By committing to randomly determine which of the two tasks will be rewarded, the principal induces a risk-averse agent to self-insure against the randomness, by choosing a more balanced profile of efforts than would otherwise be optimal for him. But stochastic determination of the task to be rewarded also has drawbacks: The total effort induced is lower, and greater risk is imposed on the agent.

In this paper, we test the main theoretical predictions of the EHM model in an "employer-employee" setting in the lab. Employee subjects privately observe on which of two tasks effort is less costly. In our main, "interactive" treatment, employer subjects choose which of two contracts will be used to compensate the employee for efforts on the two tasks. Under the stochastic contract, which type of effort is rewarded is randomly determined ex post, whereas under the deterministic contract, the two types of effort are rewarded equally. The incentive coefficients are chosen so the two contracts offer the same expected reward as a function of efforts. We compare this interactive treatment to a "computer" treatment, in which the choice between the stochastic and the deterministic one is made randomly. Efforts on the two tasks are complementary for the employer, and perfectly balanced efforts are socially efficient. We therefore measure the degree of employee gaming by the difference between the efforts chosen on the less costly and the more costly task. Subjects' risk aversion is measured in a post-experiment questionnaire.

Our key results are as follows. In line with the theoretical predictions, 1) the stochastic contract reduces employee gaming relative to the deterministic one, but also reduces total efforts; and 2) the stochastic contract reduces gaming more for more risk-averse employees. 3) The stochastic contract is on average more profitable for employers than the deterministic one, and is more so, the more risk-averse the employee. 4) In the interactive treatment, the stochastic contract is selected by employer subjects more than half the time, and employers with more education and/or better understanding of the experiment select it more frequently. Finally, 5) in the interactive treatment, but not in the computer treatment, very risk-averse employees show evidence of behavioural responses to contract choice: As their risk aversion rises, they behave less cooperatively under the stochastic contract, and more cooperatively under the deterministic one, relative to the theoretical predictions with respect to total effort. This last result may reflect the lower expected utility provided by the stochastic contract for more risk-averse employees.