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“Effort and Selection Effects of Performance Pay in Knowledge Creation”

Abstract

I study the effect of performance pay on research productivity through effort and selection effects using the introduction of performance pay in German academia as a natural experiment. To this end, I consolidated information from various, unstructured data sources to construct a data set that encompasses the affiliation history and publication records of the universe of academics in Germany. I estimate the pure effort effect in a difference-in-differences framework, comparing changes in research productivity of a treated cohort of academics, who receive performance pay because they started their first tenured position after the reform, with a control cohort that receives flat wages because they started their first tenured position just before the reform. I find a positive effort effect that is economically large; amounting to a 12 to 16% average increase in research productivity. This increase occurs mainly in response to piece-rate incentives, manifests itself most robustly as an increase in research quantity and persists for a number of years. The effort response is strongest and most robust for below-median productive academics, with increases in pure quantity as well as quality-adjusted research output, while top quartile academics do not significantly increase output. I estimate the selection effect by analyzing the rate at which academics of different productivity levels switch to the performance pay scheme. I use the fact that the old and new wage schemes compare differently for academics at different ages, which gives rise to selection incentives that are inversely related to age. Exploiting this variation in a difference-in-differences framework, I find that more productive academics are more likely to select into performance pay. Hence, performance pay increases research output in academia through both effort and selection effects. However, because the effort effect is strongest for relatively less productive academics, while relatively more productive academics select into performance pay, the selection effect partially counteracts the effort effect.