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R&D and productivity: the role of patents

Most of the studies on the rate of return on R&D and/or the contribution of R&D to productivity have related R&D directly to productivity through an extended production or cost function, where R&D is treated as an additional input on the same footing as labor and capital. Generally these studies do not incorporate any information on the R&D output, for instance as measured by the occurrence of patents or the number of patents. Moreover, few of these studies correct for selection bias, accounting for non-R&D performers, and for simultaneity bias, recognizing the stochastic nature of R&D itself.

We follow the lines of the Crépon, Duguet and Mairesse (1998) model, comprising an R&D equation, a selectivity equation accounting for non-R&D performers, a patent equation and a productivity equation, and estimate this structural model. We reexamine the R&D-productivity relationship at the light of the information provided by the innovation surveys. We use the data of the innovation surveys of France, Germany, Spain and the United Kingdom from the second wave of CIS (Community Innovation Surveys), namely the micro-aggregated data from CIS2, which pertains to the years 1994-1996. We focus our analysis on the two types of information provided by CIS2 regarding patents: how important patent disclosures are as sources of information for innovation, and whether innovators protect their innovations by patenting or not.