

“Research, Innovation and Productivity: A New Look”
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Most of the studies on the rate of return on R&D and/or the contribution of R&D to productivity growth have related R&D directly to productivity growth 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, as measured by the occurrence of patents or the share of innovative sales. 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), setting up a structural model, comprising an R&D equation, one or two innovation output equations and a productivity equation, accounting for non-R&D performers, and estimating the model by asymptotic least squares. We use the manufacturing data of the third French Community Innovation Survey, CIS3, pertaining to the years 1998-2000, merged with data from CIS2, pertaining to the years 1994-1996, from the Annual Survey of Enterprises, and from the R&D surveys.

Our first objective is to check the robustness of our results with respect to the measurement of certain variables (innovation input, innovation output, productivity), the introduction of product differentiation and the consequent existence of mark-up pricing (see Klette and Griliches, 1996, van Leeuwen, 2001), the location of exogenous variables in the structural model, the methods of estimation (2SLS vs ALS), and the treatment of simultaneity and selectivity. Our second purpose is to attempt to construct an “innovation accounting framework”, that could be used to compare innovation across sectors and to integrate the innovation accounting framework and the more standard productivity accounting framework. Our third purpose is to assess the usefulness of the innovation surveys in understanding the link between R&D and productivity.