

Industry-specific price indexes for R&D

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The heterogeneous nature of research and development activity poses a challenge for the development of aggregate price and quantity statistics for research and development as a type of intangible investment. Approaches that focus on either inputs to the R&D process or outputs of the R&D process obscure the what is intended to be measured—the unobserved output of the R&D process itself.

In this paper we first develop a set of industry-specific price indexes for R&D activity using the input price method suggested by Griliches (1984), and implemented by Mansfield et al (1987), and Jankowski (1990). For industry-specific inputs and prices, we combine intermediate input data and commodity level price indexes from BEA's industry accounts, wage and occupation data from the Bureau of Labor Statistics, and R&D expenditure data from the National Science Foundation (NSF).

We compare alternative adjustments for unobserved productivity change in the conduct of R&D using both a broad measure of business sector multifactor productivity and an alternative measure to capture productivity change in R&D's main input—labor. For the latter, we use the change in the Bureau of Labor Statistics labor productivity index for two knowledge-intensive service industries that BLS currently has indexes for, architectural services and engineering services.

We create price indexes for scientific R&D services, computer services, semiconductor manufacturing, pharmaceutical manufacturing, and transportation equipment manufacturing for the period from 1997-2007. Using these R&D price indexes, we calculate the impact of capitalizing R&D expenditures on real GDP for these industries, as measured by value added, and compare these results to other measures.