

## Taking Account...

### **BEA paper develops new R&D time series**

Detailed research and development (R&D) statistics are crucial to economists interested in the dynamics of industries that perform R&D.

In a recent working paper, Christian Awuku-Budu, an economist at the Bureau of Economic Analysis (BEA), and Carol A. Robbins, formerly an economist with BEA, developed a method for producing a consistent time series of R&D expenditures data for R&D-performing industries.

Their method essentially merges important data sets on R&D to produce a new data series with a consistent set of industry classification standards based on the main product produced by the firm for 1976 to 2008.

Broadly, the resulting time series show the outlines of a structural shift within firms that sell manufactured goods with R&D content. Increasingly, the U.S. economic activity of these firms is moving away from manufacturing and toward services. For R&D-performing firms, the transition of the federal statistical system to the North American Industry Classification System (NAICS) has played a substantial role in revealing this shift.

The authors' results have significance for the analysis of the impact of R&D on firm productivity and industry productivity. This is because previous studies

have used R&D expenditures data that had R&D allocated to the wholesale trade and the services industries, when the expenditures were in reality directed towards goods production.

The authors' new time series thus provides a better understanding of the relationship of R&D activity as an input in the production of goods and services within firms.

The paper's starting point was the National Science Foundation's annual surveys on business R&D expenditures—notably the Survey of Industrial Research and Development (SIRD) and the Business Research and Development and Innovations Survey (BRDIS).

These business R&D data sets provide an important window into the growth dynamics of industries that fund and perform R&D.

These data sets are used extensively by government agencies, researchers and private enterprises to evaluate the impact of R&D spending on economic activity. Despite the relevance and usefulness of these annual R&D expenditures data sets, these data as collected have been affected by changes in how firms have been classified into industries over the years.

Relying on data from the Census Bureau's Longitudinal Business Database (LBD) micro-data sets, the authors merged the firm-level SIRD and BRDIS data sets and linked them to estab-

lishments in the LBD. They then recoded establishments in the LBD according to NAICS and allocated the firms' R&D expenditures to establishments that are more likely to perform R&D.

The adjustment to industry classifications was done on both a broad and a more targeted basis to analyze how much focus should be placed on adjustments to firms initially classified into the management of companies, scientific R&D services, and wholesale trade industries.

The authors evaluated their new estimates by comparing them with estimates of R&D expenditures obtained using the line of business information from 2008 BRDIS data. The 2008 BRDIS began classifying R&D expenditures based on the line of business.

Compared with the hierarchical payroll method, which uses information about the domestic component of firm activity, this new method reduces the amount of R&D expenditures allocated to wholesale trade by more than 30 percent.

In addition, it increases the amount of R&D expenditures allocated to manufacturing industries by 5 percent. The manufacturing industries with the largest increases are computer and electronic product manufacturing (60 percent) and chemical manufacturing (25 percent).

Awuku-Budu and Robbins' paper is available on the [BEA Web site](#).