



Putting Business Software Purchases into the National Accounts

The U.S. economy is constantly evolving. New technologies are continuously transforming the production and delivery of new and existing goods and services. Business practices adapt just as readily to changes in technology. Today, for example, the scramble for market share and profitability forces firms to find innovative ways to add value to their firm's products or services.

These innovations often require computer hardware and software. In the past, when businesses generally used mainframe computers, they acquired the hardware and software as a bundle. With the advent of personal computers and minicomputers, a greater percentage of business software was purchased separately from hardware. Yet business software continued to count as an investment in the National Income and Product Accounts (NIPA) only when purchased as installed software on a new computer. Software purchased separately was considered an intermediate input and did not count as capital investment. Hence, the unbundling of computer hardware and software purchases led to the unintended consequence of classifying a considerable portion of business software expenditures as intermediate products.

Given the boom in computer purchases, and the fact that computer software, like other capital expenditures, provides a flow of services that lasts more than a year, the Bureau of Economic Analysis (BEA) recognized the need to address this issue, and did so in the Oct. 28 release of the advance third-quarter GDP report. Accompanying the advance report was the 11th comprehensive revision of the NIPA. The BEA will now treat business purchases of computer software and "in-house" software production as fixed investments to remedy the classification problem discussed above.

Adding business software purchases to the new equipment and software (E&S) component of nonresidential fixed investment—formerly known as producers' durable equipment (PDE)—raises the level of GDP. In 1998, for example, the nominal value of software investment totaled \$123.4 billion, which was 15.1 percent of E&S investment and 1.4 percent of GDP. A back-of-the-envelope calculation shows that reclassifying software purchases as fixed investment boosted the growth of real GDP by about 0.1 percentage point a year during this business expansion (first quarter of 1991 to second quarter of 1999). Moreover, with software prices falling much less than prices of computers and peripheral equipment during this period (1.6 percent versus 19.3 percent), the inclusion of software prices has had the effect of slowing the rate of decline of prices of information processing equipment (computers, software and other equipment). This explains why the growth of real information processing equipment was revised down from 19.4 percent to 17.1 percent.

This comprehensive revision also reclassified the counting of government employees' pension contributions as personal saving, not government saving. Another significant change is the use of the Bureau of Labor Statistics' new *CPI research series using current methods* to calculate real personal consumption expenditures (PCE). As discussed in the August 1999 issue of *National Economic Trends*, this retrospective consumer price index grew by about 0.3 percentage points per year less than the currently published CPI between 1983 and 1998, so the published figures for real PCE growth should increase commensurately. Finally, the BEA introduced a new measure of banking output that will strive to measure productivity gains in this industry more accurately.

The net result of the comprehensive revision was to boost the average annual growth rate of real GDP during this expansion from 3.1 percent to 3.5 percent.

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