

National Economic Trends

Accounting for Computers

In 1987, Nobel Prize laureate Robert Solow quipped: “You can see the computer age everywhere but in the productivity statistics.”¹ While computers may have already seemed ubiquitous in the late 1980s, their proliferation throughout the economy during the 1990s proceeded at a phenomenal pace. As shown in the chart, total nominal expenditures on computers and peripheral equipment in the U.S. tripled over the decade, rising from \$49 billion in 1990 to nearly \$150 billion in 2000. Recent weakness in sales of computer equipment is also evident: During the most recent two quarters, demand fell \$13.6 billion from its peak in the third quarter of 2000. When placed in perspective, however, the drop-off in demand is still small relative to the increases of the previous decade.

The bulk of computer sales during the 1990s went to the business sector. Business spending on computers—a component of fixed investment in the National Income Accounts—rose from \$39 billion in 1990 to more than \$114 billion in 2000. On average, business investment accounted for nearly 75 percent of all computer purchases over the decade, while households accounted for about 17.6 percent and governments for 7.7 percent.

The rapid increase in computer investment by businesses is part of a general trend of rising investment in information and communications technology (ICT). Computer equipment alone accounted for more than 8 percent of total nonresidential business fixed investment in 2000. When software, communication equipment and other information-processing equipment is included, ICT investment accounted for a startling 40 percent of total business investment, eclipsing the more traditional expenditures for industrial and transportation equipment.

It should be noted that these data represent nominal expenditures on computers, and therefore dramatically understate the expansion of effective computing power, given the rapid pace of quality improvement in comput-

ers. When measuring the price of computers, the U.S. Bureau of Economic Analysis applies a statistical technique for estimating a standardized cost of computing power—known as a hedonic price index. From 1987 through 2000, the ratio of this quality-adjusted price index to the price index for non-computer final sales declined nearly 95 percent (see chart). That is, the quantity of computing power purchased with one dollar in 1987 cost only an inflation-adjusted nickel in 2000.

Many economists attribute recent increases in U.S. labor productivity growth to the widespread application of new computer technologies in the business sector, fulfilling Solow’s prediction that the proliferation of computers ought to have productivity-enhancing effects. As ICT investment surged during the 1990s, growth of output per hour in the non-farm business sector accelerated to a 2.8 percent annual rate from 1996 through 2000, up from an average growth rate of 1.6 percent during the previous 25 years. It is yet to be seen whether strong productivity growth will continue; however, it appears likely that the computer sector will continue to be a vibrant part of the U.S. economy throughout coming years.

—Michael R. Pakko

¹ Solow, Robert M. “We’d Better Watch Out.” *New York Times Book Review*, July 12, 1987, p.36.

