



What's **right** with the US economy

William W. Lewis, Vincent Palmade,
Baudouin Regout, and Allen P. Webb

The secret behind the new economy isn't information technology
but old-fashioned competition and managerial innovation.

As companies attempt to cope with an economic downturn and the United States fights a war on terrorism, many wonder whether the long-term health of the US economy will be undermined. The answer depends on what happens to the productivity growth rate—the main determinant of how fast the economy can grow. At issue is whether the near doubling of US productivity growth rates during the late 1990s, from 1.4 percent (1972–95) to 2.5 percent (1995–2000), can continue.

Our yearlong research¹ indicates that many of the product, service, and process innovations underlying the productivity acceleration of the late 1990s will continue to generate productivity growth rates above the 1972–95 trend for the next several years, although probably not as high as those of 1995 to 1999. Higher productivity, in turn, will boost economic growth.

Surprisingly, the primary source of the productivity gains of 1995 to 1999 was not increased demand resulting from the stock market bubble, as some

¹The study on which this article is based involved a collaboration of the McKinsey Global Institute, the Firm's high-technology practice, and the San Francisco office. Greg Hughes, James Manyika, Lenny Mendonca, and Mike Nevens helped lead the project. The research team, which deserves special recognition, included Angeliq ue Augereau, Mike Cho, Brad Johnson, Brent Neiman, Gabriela Olazabal, Matt Sandler, Sandra Schrauf, Kevin Stange, Andrew Tilton, and Eric Xin. The full study is available on-line at www.mckinsey.com.

economists have claimed. Nor was information technology the source, though companies accelerated the pace of their IT investments during those

years.² Rather, managerial and technological innovations in only six highly competitive industries—wholesale trade, retail trade, securities, semiconductors, computer manufacturing, and telecommunications—were the most important causes (Exhibit 1).³ The other 70 percent of the economy contributed a mix of small productivity gains and losses that offset each other. In addition, cyclical demand factors were important in some parts of the economy.

It is not unusual, we found, for only a small number of sectors to experience a productivity jump during any four-year period. But in the late 1990s, these six sectors, departing

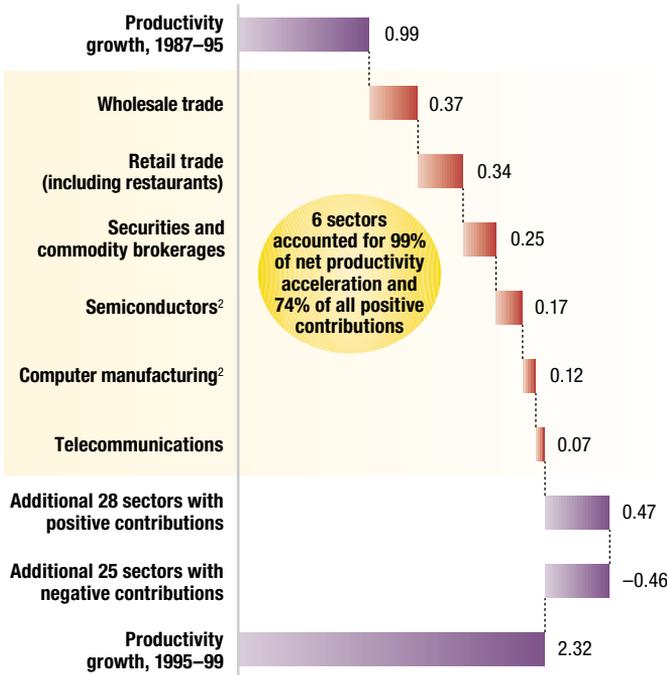
from the norm, either enjoyed extremely large leaps in productivity (for instance, semiconductors and computer manufacturing) or accounted for a large share of employment (retail and wholesale).

At the national level, the relationship between IT spending and productivity is unclear. Many sectors other than the six jumping ones increased their pace of IT investment but experienced stagnant or even *slower* productivity growth (Exhibit 2). We found an inconclusive correlation between the acceleration

EXHIBIT 1

Six sectors led the way

Contributions of selected sectors to 1995–99 US labor productivity growth acceleration,¹ compound annual growth rate (CAGR), percent



¹Analysis based on US Bureau of Economic Analysis (BEA) sector data, which differ slightly from widely publicized US Bureau of Labor Statistics (BLS) aggregate data. BLS labor productivity growth figures show 1.4% CAGR for 1987–95 and 2.5% CAGR for 1995–2000.

²Semiconductors industry (representing 20% of overall productivity growth) is a subset of Electronic and Electric Equipment, which as a group contributed 17%; computer manufacturing (representing 10% of overall productivity growth) is a subset of Industrial Machinery and Equipment, which as a group contributed 12%.

Source: US Bureau of Economic Analysis; McKinsey analysis

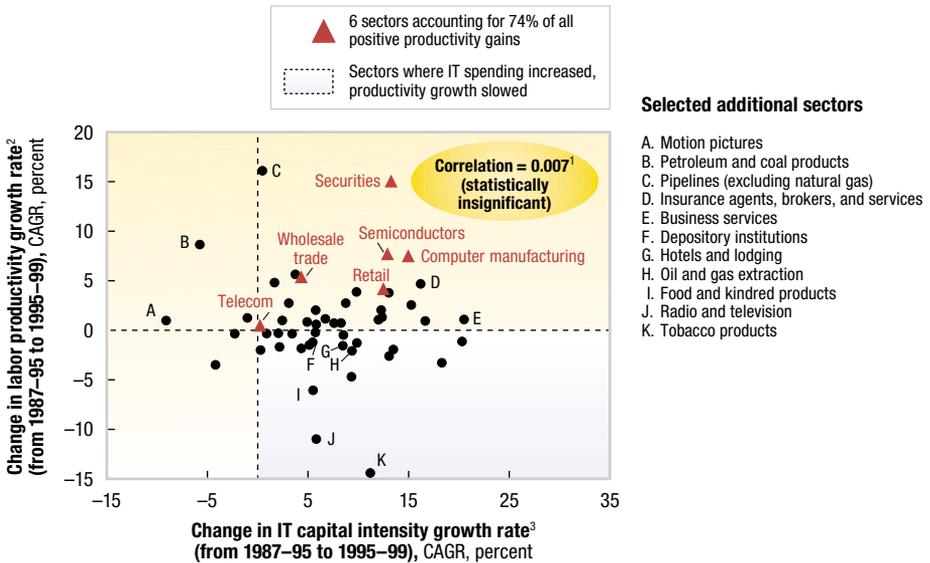
²Between 1987 and 1995, information technology investments by US companies rose by a compound annual rate of 11 percent. Between 1995 and 1999, this compound annual growth rate jumped to 20.2 percent.

³These six sectors accounted for virtually all of the net productivity acceleration and for 74 percent of all positive contributions.

EXHIBIT 2

It takes more than just IT

Correlation between US labor productivity and information technology (IT) capital intensity in selected sectors, 1987–95 to 1995–99, compound annual growth rate (CAGR), percent



¹Excludes coal mining, farms, and metal mining because of low initial levels of IT capital stock and excludes holding companies for measurement reasons; although weighting each sector by its share of employment yields a statistically significant correlation of 0.26, excluding the 6 jumping sectors yields statistically insignificant results.

²Measured as change in real value added ÷ PEP (people employed in production).

³Measured as change in real IT capital stock ÷ PEP.

Source: US Bureau of Economic Analysis; McKinsey analysis

of IT investments and changes in productivity growth. In fact, taken as a group, the other 53 economic sectors had almost no productivity growth.

The challenge, then, was to understand what caused the productivity acceleration in the six key sectors. We did a detailed study of these sectors, as well as three others that invested heavily in IT but failed to boost productivity—hotels, long-distance data telephony, and retail banking.

Explaining the 1995 productivity acceleration

Within the six jumping sectors, the most important cause of the productivity acceleration after 1995 was fundamental changes in the way companies deliver products and services. Sometimes these innovations were aided by technology (whether new or old), sometimes not. In all six sectors, high or increasing competitive intensity was essential to the spread of innovation, and in two sectors, regulatory changes played an important role in raising that intensity. Cyclical demand factors and a shift in consumer purchasing patterns toward higher-value goods were important in explaining the acceleration of productivity in retail, wholesale, and securities.

Structural factors: Competition and innovation

The bulk of the acceleration in productivity after 1995 can be traced to managerial and technological innovations that improved the basic operations of companies. These innovations were structural and are likely to persist. Sometimes, the catalyst was a dominant player with a superior business model; other times, it was managers using new technology to redesign core operations.

In general-merchandise retailing, productivity growth more than tripled after 1995 because competitors started more rapidly adopting Wal-Mart's innovations—including the large-scale (“big-box”) format, “everyday low prices,” economies of scale in warehouse logistics and purchasing, and electronic data interchange (EDI) with suppliers (see “Retail: The Wal-Mart effect,” in the current issue). As a result, Wal-Mart's competitors increased their productivity by 28 percent from 1995 to 1999, while Wal-Mart itself raised the bar further by increasing its own productivity by an additional 22 percent. Although e-commerce grew rapidly during this period, its penetration (0.9 percent of retail sales in 2000) was too low to make a difference in overall retail productivity. We estimate that Internet commerce contributed less than 0.01 percentage points to the 1.33 percent jump in economy-wide productivity growth.

The operations of wholesalers underwent similarly dramatic changes during the middle of the 1990s as new warehouse-management systems were adopted (Exhibit 3). Pharmaceuticals wholesalers, for instance, responded to increasing price pressure from large retailers by automating distribution centers. Because each center keeps an inventory of tens of thousands of different items, stocking, picking, and shipping have traditionally been highly

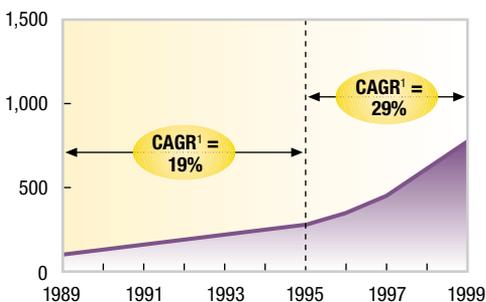
labor-intensive. The combination of pre-1995 hardware (bar codes, scanners, picking machines) and software for tracking and controlling inventory allowed wholesalers to automate their flow of goods partially and to increase their labor productivity greatly.

In computer manufacturing, nearly all of the productivity acceleration was due to innovations outside the sector itself (see “Computers: Why the party's over,” in the current issue). Technological improvements

EXHIBIT 3

The changing warehouse

Sales of warehouse-management systems, \$ million (nominal \$)



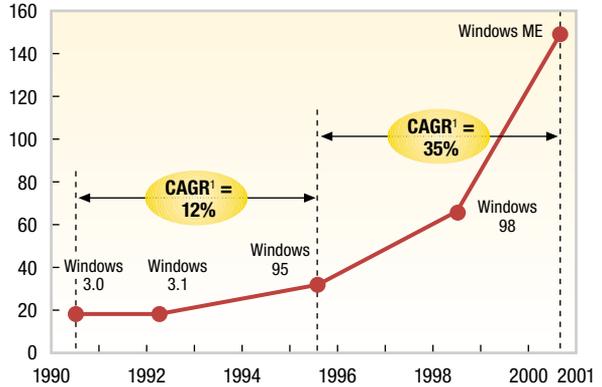
¹Compound annual growth rate.
Source: AMR Research

in microprocessors and other components (memory, storage devices), as well as the integration of new components (CD-ROMs, DVDs), caused an acceleration in the value of computers produced. At the same time, the popularization of the Internet and the accelerating processing requirements of Microsoft's Windows operating systems (Exhibit 4)

EXHIBIT 4

A decade of speedier PCs

Processor speed requirements for Microsoft operating systems, MHz



¹Compound annual growth rate.
Source: Microsoft; Datapro; McKinsey analysis

caused a spike in demand for more powerful personal computers. These two factors further contributed to the high productivity growth in the manufacture of computers and semiconductors.

Productivity growth in the semiconductor industry accelerated mainly because the performance of the average chip did. Largely in response to competitive pressure from Advanced Micro Devices, Intel took less time to bring out new and better chips than it had done previously.

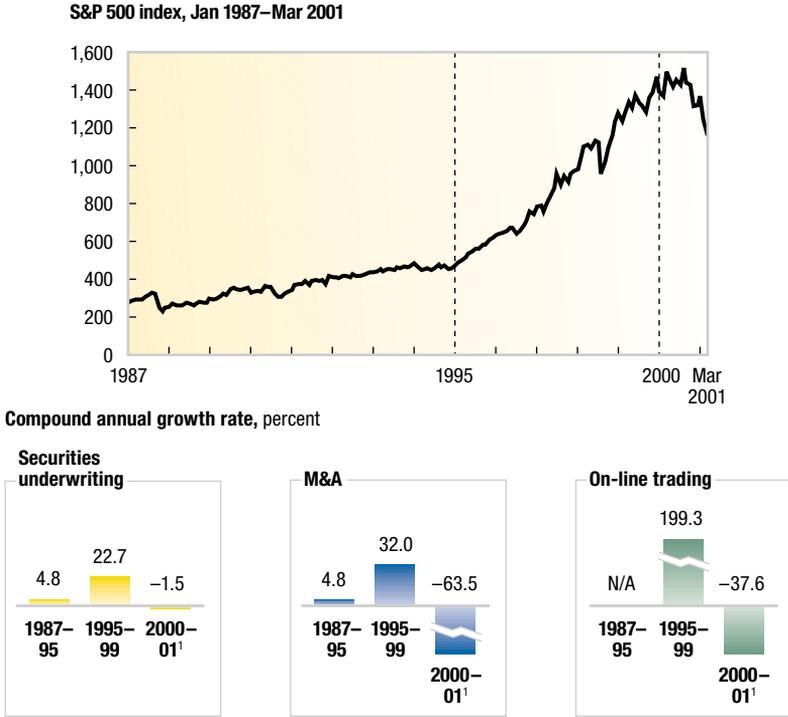
The securities industry was the only sector we studied in which the Internet materially boosted productivity. At the end of 1999, roughly 40 percent of retail securities trades were being conducted on-line, up from virtually zero in 1995, and a given number of frontline employees can now broker ten times as many trades as they could then. Competition from on-line discount brokers, such as E*Trade and Charles Schwab, was critical to the rapid diffusion of these innovations in the traditional brokerage houses.

Regulatory changes increased competition and had a significant effect on productivity in some cases. In the securities industry, the US Securities and Exchange Commission's order-handling and 16th rules⁴ sharply reduced transaction costs, allowing institutional investors to take advantage of increasingly small price anomalies and boosting trading volumes. In the telecom sector, the licensing of new spectrum for mobile telephony heightened competition and sparked faster price decreases, lifting both penetration and

⁴The 16th Rule refers to the SEC's 1997 mandate to quote securities prices in increments of 1/16th rather than 1/8th. The New York Stock Exchange and the Nasdaq started experimenting with decimalization even before the SEC's April 2001 deadline.

EXHIBIT 5

Cyclical demand in the securities industry



¹From Q1 2000 to Q1 2001.
 Source: Securities Industry Association; Investment Company Institute; US Securities and Exchange Commission; New York Stock Exchange; Nasdaq; McKinsey analysis

usage. In both the securities industry and the telecom sector, larger volumes allowed industry players to leverage fixed costs.

Cyclical demand factors

Some of the acceleration in productivity after 1995 was due to demand factors that may not be sustainable. In the securities industry, the soaring stock market led to productivity advances in three different ways (Exhibit 5). First, lofty index values (particularly Nasdaq’s) fueled a surge in on-line retail trading. Second, they also increased the value of assets under management, boosting the productivity of money managers. Finally, they increased the number and value of initial public offerings and of mergers. These factors explain half of the productivity jump observed in the securities industry.

In general-merchandise retailing, and most likely in the rest of retail and in wholesale, almost half of the measurable productivity jump reflected the higher value of the goods that consumers increasingly favored. Retailing

experts believe that the shift was mainly the result of growing confidence, income, and wealth rather than a marked improvement in the retailers' techniques of enticement.

The role of information technology

Contrary to conventional wisdom, the widespread adoption of information and communications technology was not the most important cause of the acceleration in productivity after 1995. Our nine sector case studies clearly show that the relationship between IT and labor productivity is extremely variable.

In rare cases, IT can deliver truly extraordinary productivity improvements, expanding labor capacity by an order of magnitude. As mentioned above, on-line securities trading requires only a fraction of the frontline labor employed in traditional channels. In mobile telecommunications, cellular equipment employing new digital standards made better use of the available spectrum, spurring rapid price declines and a spike in usage. In both cases, the product or service itself, being intangible information that could easily be digitized, was highly susceptible to such improvements.

In most cases, however, IT was just one of many tools that creative managers used to redesign core business processes, products, or services. A significant portion of Wal-Mart's business innovations (such as the big-box format) was independent of IT. Where IT did play a role, it was a necessary but not a sufficient enabler of productivity gains. To reap the full productivity benefits of inventory-management systems or EDI, for instance, a business must implement operational-process changes. The same is true of the automation of warehouse and distribution centers in the wholesale sector.

To understand why IT is not a panacea, we looked at three sectors that invested heavily in IT but experienced no improvement in productivity growth: hotels, the long-distance data portion of the telecom sector, and retail banking (*see* "Banking: The IT paradox," in the current issue). Some spending on IT in these sectors and elsewhere in the economy was designed to maintain capabilities, such as investments in Y2K compliance and more rapid upgrades of personal computers to ensure compatibility with emerging Windows standards. Other IT expenditures, on things such as Internet and corporate-networking equipment, were made to generate future rather than immediate productivity benefits. The confluence of these unusual demand factors explains most of the acceleration in IT spending from 1995 to 1999.

It is also possible that IT increases the consumer's convenience in ways that are not fully captured by government productivity measures. Even so, this

would not be sufficient to explain the “IT paradox.” Hotels invested heavily in creating central reservation systems that provided customers with some unquantifiable value (for instance, immediate, centralized information on the availability of rooms), but the increase in convenience was probably modest. The added convenience of on-line banking also doesn’t appear in government productivity measures. But even if it were possible to correct for this measurement problem, the small number of on-line transactions would not have been enough to reverse the deceleration of productivity growth in retail banking.

Some IT investments do not appear to be delivering the intended results, and whether they ever will remains to be seen. Retail banks and hotels, for instance, have collected significant amounts of customer data that they have yet to use productively. Companies in the retail-banking industry bought an average of two PCs per employee from 1995 to 1999. Some of this computing power was not fully utilized and some, it is likely, never will be.⁵ Long-distance telephone players made enormous investments in metropolitan and long-haul networks that are currently underutilized and will probably remain so for several years to come.

Our conclusion about the effect of IT on productivity is straightforward. IT can be quite valuable when deployed as part of a management plan to reorganize specific core activities of a business. In this respect, it is not different from other forms of capital—new building designs, new materials-handling systems, new semiconductor production tools. But when generic IT solutions are applied to support functions, or when IT represents no more than a “me-too” investment, it is unlikely to move the needle on a company’s productivity. A robust explanation of the recent acceleration in productivity must therefore go well beyond IT.

The future of US productivity

If the pattern of the two most recent recessions (1981–82 and 1991–92) holds, the impact of a recession on labor productivity over the next four years will be minimal. Even if the tragic attacks of September 11 cause a sharp decline in productivity growth, we would expect an economic recovery, and thus an uptick, prior to 2005.

The more important question for the longer term is whether the acceleration in productivity from 1995 to 1999 is sustainable. We estimate that at least half of what occurred in the six jumping sectors can be sustained over the next five years. Wal-Mart still enjoys a sizable productivity advantage over

⁵From 1995 to 1999, banks spent a total of \$5,253 per employee (in nominal dollars) on new PCs.

its competitors and will continue to force efficiency improvements in the industry. The limited penetration of warehouse automation (now at just 25 percent), and, to a lesser degree, of mobile telephony and on-line trading, leaves room for further growth, and thus productivity gains, in those sectors. Both the computer-manufacturing and semiconductor industries should benefit from a continuation of the current rate of improvement in the performance of microprocessors.

Clearly, however, some of this acceleration will be unsustainable. The burst in demand for personal computers is behind us, and the effects of the stock market bubble on asset valuations, M&A, and securities trading have already largely evaporated. We cannot judge whether consumers will continue to shift their purchasing patterns in favor of higher-value goods at the 1995–99 rate or know what will happen in the portions of the retail and wholesale sectors that we did not study.

A larger source of uncertainty about future productivity growth is the behavior of the rest of the economy. A review of the performance of the other 53 sectors over the past two decades reveals that both their contribution to national productivity growth and their average annual productivity growth rate have been quite small. Those figures, however, show considerable volatility—some of it caused by business cycles and some by changes in industry dynamics and structure. If historical precedents hold, this kind of noncyclical volatility could reduce the national rate of productivity growth over the next four years by 0.1 percentage points annually or increase it by as much as 0.4 percentage points annually.

It is possible that other sectors of the economy will defy the historical trend and experience extraordinary productivity jumps. The key contributor to such jumps would be innovations, such as Wal-Mart's improvements in its business system or on-line securities-trading technology, that streamlined labor-intensive activities or leveraged fixed labor costs. Competition, which could be triggered by regulatory changes, is required to diffuse innovation. A quick scan of the economy revealed several sectors showing the first signs of emerging innovators (such as software; media, including motion pictures; insurance carriers; and depository and nondepository institutions) and of promising regulatory changes (electric, gas, and sanitary services as well as pharmaceuticals). However, the number of these sectors, their share of total employment, and the potential magnitude of their jumps are not impressive. Therefore, we believe, continuing volatility in the rest of the economy's productivity growth rate is likely to encompass the effect of these innovations and regulatory changes.



Although uncertainty about the performance of all these factors makes precise predictions impossible, our analysis indicates that overall productivity growth could be as low as 1.6 percent or as high as 2.5 percent.⁶

Even our low estimate offers ample reason for optimism about the US economy, regardless of what happens in the short term. The six key sectors will continue to generate above-trend productivity growth for at least several more years. No one can predict when and where the next entrepreneurial initiative will strike outside of these sectors. But healthy levels of competition, 20 years of deregulation, and a long tradition of US ingenuity will allow the country's economy to continue to define the productivity frontier. **Q**

⁶For a full explanation, see chapter 3 of the full report, at www.mckinsey.com.

Bill Lewis is the director of the McKinsey Global Institute, where **Vincent Palmade** is a principal; **Baudouin Regout** is a consultant in McKinsey's New York office; **Allen Webb** is a consultant in the Pacific Northwest office. Copyright © 2002 McKinsey & Company. All rights reserved.