



JOINT ECONOMIC COMMITTEE

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PRODUCTIVITY: THE PATH TO PROSPERITY

Productivity may be the most important economic measure because rising productivity will result in a more prosperous future. In the mid-1990s, there was an up-tick in the rate of productivity growth, as shown in Figure 1. Will this favorable trend continue?

This paper highlights: why productivity is important; what drives productivity growth; why productivity began to surge in the mid-1990s; and whether productivity will continue to increase at a robust rate.

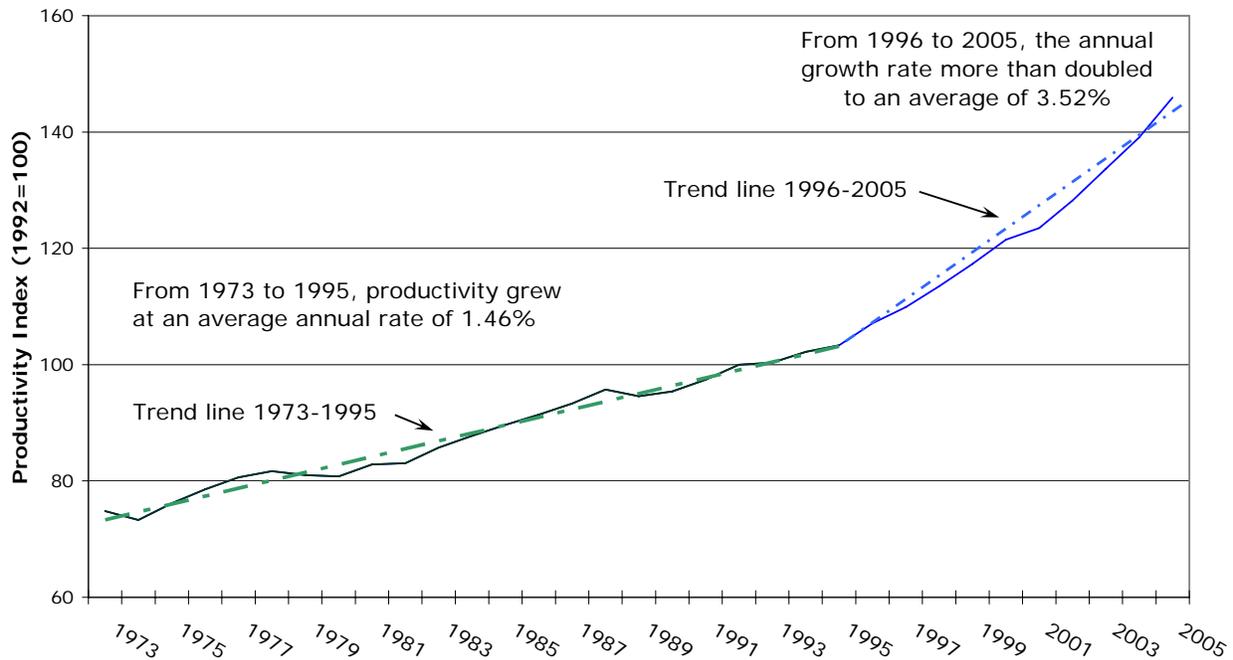
The importance of productivity

Strong productivity growth is important because it allows one to answer the following question in the affirmative: In the future, will the U.S. be wealthier?

Labor productivity measures the ratio of economic output to labor hours worked to produce that output. If the average American is to enjoy a higher standard of living in the future, then future workers must produce more economic output for every labor hour than today's workers.

Consider a farmer who increases wheat production from 50 bushels an acre to 100 bushels an acre by using advanced cultivation methods or high-yield plants. All other things equal – the cost of inputs, the amount of effort expended by the farmer or the sales price of wheat – the additional 50 bushels of wheat produced make the farmer wealthier. The same is true of increasing labor productivity in the economy as a whole. Higher productivity increases the return to labor and

**Figure 1. Productivity Growth Index: 1973-2005
Nonfinancial Corporate Sector**



Source: Bureau of Labor Statistics/Haver Analytics. Because of the difficulty measuring output in some sectors of the economy, many economists prefer the nonfinancial corporate sector productivity statistic.

capital that can be spent on current consumption or saved for the future. All things equal, the faster labor productivity increases, the faster a society becomes richer.

Increasing productivity will become especially important in the future. The average worker will need to be more productive because the labor force will not grow as quickly as it has in the past. Baby boomers will begin retiring shortly and, in order to maintain or improve the current standard of living, those still active in the labor force will need to produce more economic output per hour of work.

The sources of productivity growth

There are several sources of productivity growth. The first is technological innovation. A classic example of a technological innovation boosting productivity is the application of the internal combustion engine to farming. A farmer with a tractor can plow more acreage in one hour than a farmer with a horse. The increase in the number of acres plowed per hour of farmer labor would register as a large increase in productivity. While the list of core technologies invented in the late 19th and early 20th centuries is relatively short, the application of those technologies to manufacturing, farming, housing and domestic production is extensive. Some economists argue that the application of the late 19th and early 20th century inventions created one large wave of robust productivity growth up to the 1970s.

A change in business practices or corporate organization is the second source of productivity growth. The industry detail on productivity trends reveals that the retailing sector has experienced a surge in output per worker. This can be partially attributed to the advent of the so-called big-box stores that can sell goods at lower cost. Just-in-time delivery of inventory is another type of business practice that boosted productivity. The

dramatic “delaying” of corporate America reduced the number of management personnel required to produce any given level of output.

Frequently, a new business practice can make use of a new technology to supercharge productivity growth. For example, manufacturing firms, transportation companies and retail outlets can collaborate throughout the entire supply chain to adjust production and shipments according to real-time data collected at the retail register. In this way, a business practice like just-in-time inventory can be enhanced by computer technology and electronic transactions.

Increasing the stock of capital relative to the stock of labor is another source of productivity growth. In recent years, as a result of the increasing investments in information technology (IT), capital inputs have increased more quickly than labor inputs. This phenomenon is called capital deepening and is estimated to contribute between one third to one half of the growth in productivity.

The foregoing origins of productivity growth are probably the most noteworthy, but there are other factors that can influence productivity. A well-educated, high-skilled workforce enhances productivity. On the other hand, some economic historians have noted that large waves of immigration may have lowered aggregate productivity. This is because immigrants who arrived in large waves had relatively few skills and, as a result, produced less economic output per hour than high-skilled labor. (Recall that labor productivity is measured in economic output per hour. The value of the output of a minimum wage worker would be significantly less than, say, an engineer.)

Given that technological innovation, new business practices and capital deepening can boost productivity, what effect have computers and communication advances had

on productivity? Until around 1995, the answer was: not much.

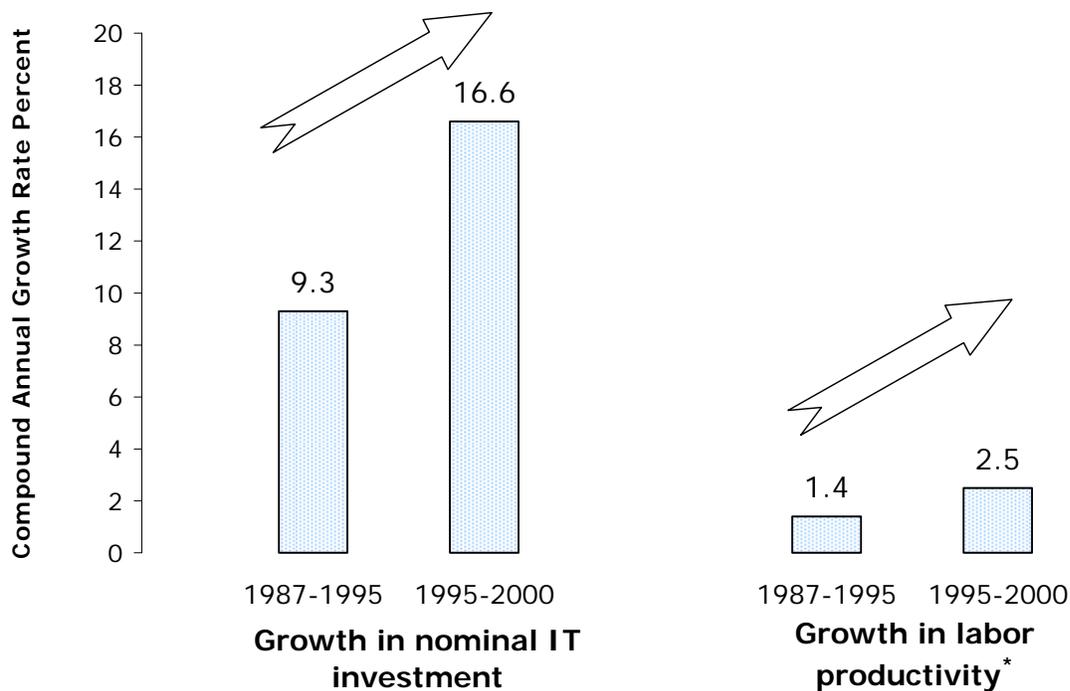
Trends in productivity growth

Starting around 1973, economists noticed a drop in the rate of productivity growth. Some economists have argued that by 1973, the benefits from the technological innovations in the previous century were exhausted. There is, however, no consensus about the cause of the productivity growth slowdown.¹ The post-1973 productivity slump was a puzzle, but a more troubling mystery was why the benefits of IT were not evident in the productivity measures. In 1987, Nobel Prize-winning economist Robert Solow quipped that computers were everywhere except in the productivity statistics.

Then, the productivity data in the mid-1990s showed a distinct increase in the rate of productivity growth.

That IT had played a major role in the productivity surge after 1995 is little in dispute. Many economists and analysts felt vindicated that investments in IT – computers, software and communication equipment – had finally become evident. As the economy grew and productivity increased, there was talk about IT ushering in the “New Economy” and its attendant benefits of low inflation, low unemployment and increasing wealth. Early in the trend, while the economy was racking up impressive productivity statistics through the late 1990s, two perspectives seemed to dominate the discussions about the extent to which IT boosted the productivity gains and

Figure 2. Growth in IT Investment and Labor Productivity



Source: McKinsey Global Institute. "U.S. Productivity Growth: 1995-2000." October 2001; Bureau of Labor Statistics and Bureau of Economic Analysis for source data.

* Excludes output from farms and government

whether future gains would be as robust. For

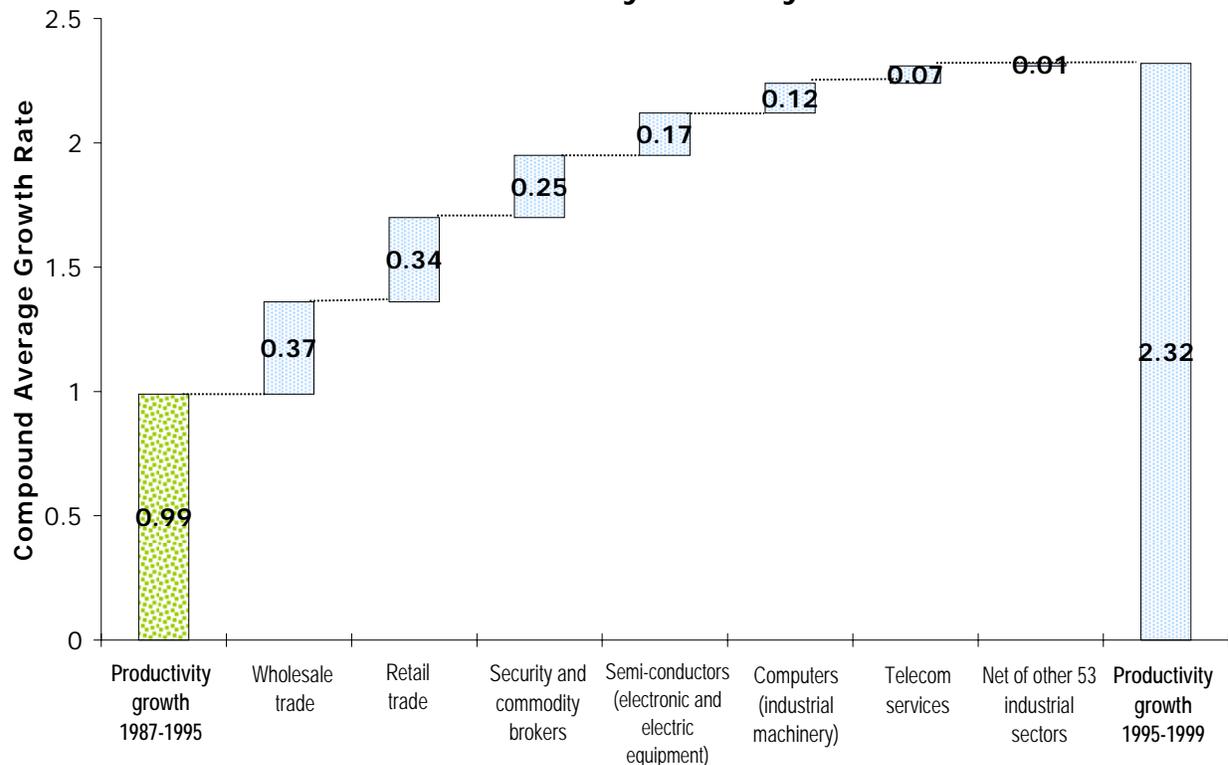
want of better terms, these two groups are called the “skeptics” – those who question the existence of the New Economy – and the “optimists,” who expect IT to continue to boost productivity well into the future.

The skeptics stressed that the individual industries registering the gains were narrowly focused: almost all of the productivity surge could be ascribed to the IT-producing industries and wholesale and retail trade. The skeptics argued that future productivity growth would slow. One source of productivity growth in retailing – the movement to the big-box store format – was a one-time gain that couldn’t be repeated. Moreover, if the New Economy existed, one would see gains in all industries that used IT. After all, computers were supposed to make all firms more efficient.²

Until the recession of 2001, the skeptics seemed to have the data on their side, but then the unexpected happened. While productivity did decline as the economy tilted into recession – productivity growth slows as the rate of economic growth diminishes because economic output drops more quickly than worker hours – it didn’t slow to the extent expected and it quickly recovered. Productivity growth did not return to the lackluster 1973-1995 trend. Furthermore, the percentage share of GDP attributed to IT-producing industries fell from 2000 to 2004, making it more difficult to argue that IT-producing industries were leading the productivity gains, as they did in the late 1990s.

It could be argued that these productivity

Figure 3. Contribution to Productivity Acceleration from 1995 to 1999 by Industry Sector



Source: McKinsey Global Institute. "U.S. Productivity Growth 1995-2000." October 2001; Bureau of Economic Analysis for source data.

gains were a result of the dramatic corporate cost-cutting following the 2001 recession. If so, then the post-1995 productivity boost may not last. On the other hand, if the boost can be attributed to continued application of IT in IT-using industries, then productivity may continue to grow at a robust rate.

The future of productivity growth

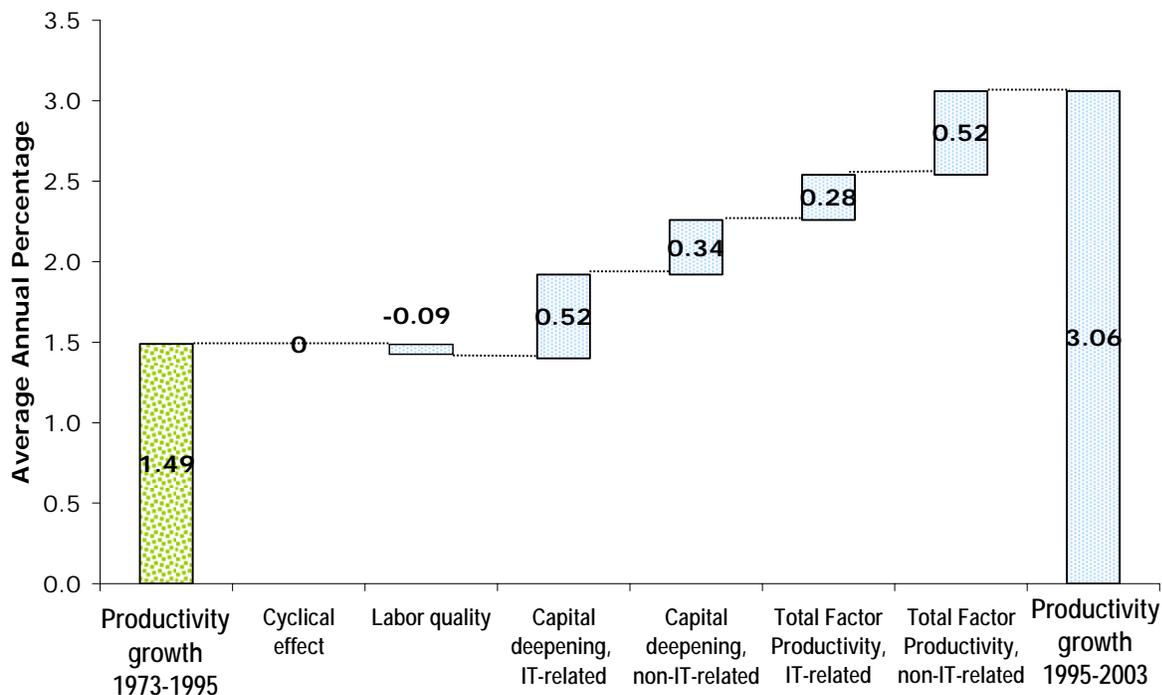
At issue is the degree and rate of technological diffusion of IT, how well organizations leverage IT applications in their business practices and the extent to which IT boosts the economic return to labor. While computers, internet connections and e-commerce are all well entrenched in businesses and homes, many IT applications merely substitute one type of human transaction for another and, as a result, don't necessarily boost productivity. The recent big productivity bounce results from increasing

the economic return associated with each transaction or to greatly reduce the time required to complete a transaction.

It takes a large investment in equipment, software, training, reorganizing, as well as a multiple-year time commitment, for a corporation to realize all the benefits of IT. This, the productivity optimists say, is the reason it took so long for productivity measures to reflect the investment in IT and, more importantly, why productivity growth will persist. Just as it took decades for electricity and electric motors to find widespread applications, it will take many years for corporations to reconfigure business processes to tap all of the potential benefits associated with IT.³

The optimists would hasten to add, however, that some of the productivity gains may be hard-won. Markets that are distorted

Figure 4. Sources of U.S. Productivity Acceleration



Source: Jorgenson, Dale W., Mun S. Ho and Kevin J. Stiroh. "Will the U.S. Productivity Resurgence Continue?" December 2004. Data are for the U.S. private economy. Jorgenson, Mun and Stiroh use a more comprehensive productivity measure than the one used in the official BLS statistics.

by regulations or monopolistic associations will hinder or even prevent many of the most significant gains. Employees or professions that currently serve a mediating function in economic transactions will have to adapt to a changing marketplace. For example, booking travel on the internet greatly reduced the need for travel agents to act as the “middleman” between airlines and customers. In a similar way, IT facilitated faster decision making and allowed corporations to remove unnecessary layers of management. In the future, if market forces are allowed to work to the benefit of all consumers, the manner in which real estate and automobiles are bought and sold will also undergo dramatic restructuring.

Regulations, barriers to entry and disincentives to innovate stifle productivity growth and economic dynamism. A study by the McKinsey Global Institute compared productivity and economic performance across countries and concluded that limiting government’s interference in the market and removing regulations that protect special economic interests were critically important policies for boosting productivity growth.⁴

Compared to other industrial powers, the U.S. has enjoyed significantly better productivity growth and economic performance. This is largely because the U.S. is less burdened by regulations and the influence of special economic interests. European regulations, in contrast, prevent efficient big-box stores from operating. French state regulations mollycoddle labor at the cost of productivity growth. The short-term gain of labor protection today may come at a devastating social cost in the future because, compared to the U.S., France will have a relatively smaller active labor force.

Conclusion

The U.S. has enjoyed strong productivity growth over the last ten years. This will help alleviate the economic pressures of an aging population and it bodes well for a widespread increase in the standard of living for the average American. In recent years, the U.S. productivity growth rate has been appreciably greater than other advanced economies. The U.S. experience provides an essential economic lesson. Technological progress, business innovation and the competitive forces of the market drive an increasing level of prosperity.

¹ More detailed industry data reveals that productivity changes from 1973-1995 were not uniform. Productivity growth for durable goods manufacturing, for example, increased at a respectable rate.

² See “Exploding Productivity Growth: Context, Causes, and Implications” (2003) and other papers by Robert Gordon for discussions by an economist who might be described as skeptical of the “New Economy.”

³ See *The Past and the Future of America’s Economy* by Robert D. Atkinson (2004) for a historical overview of technological progress and productivity from an “optimistic” perspective.

⁴ See *The Power of Productivity: Wealth, Poverty and the Threat to Global Stability* by William W. Lewis (2004) and “U.S. Productivity Growth: 1995-2000” by McKinsey Global Institute (2001).