

Anatomy of a miracle

Gerard Baker takes a hard look at the technological changes that are said to be fuelling a productivity revolution in the US

Strung around the freeways that now barely contain the bulging Texas metropolis of Dallas, hundreds of high-tech manufacturing plants bear witness to what many economists believe is the key to the extraordinary success of the US economy in the late 1990s.

Dallas is one of the many areas of the country that have seen explosive growth in high-tech business. At Texas Instruments, one of the largest local employers, the management believes the growing use of computers has helped radically to transform US competitiveness.

Improvements in productivity – the output per hour worked by employees – at Texas Instruments' plants have enabled the company to make a greater number of more efficient and less expensive computer products. Texas Instruments has a term for these productive gains – "phantom fab", or a plant the company has not had to build. Every year for the past three years, productivity growth has been so strong that it has increased the company's capacity by the equivalent of the output of one manufacturing plant.

Mr Vladi Cattó, chief economist at Texas Instruments, says these productivity leaps have not only helped the company expand but have also benefited the rest of the economy through improvements to information technology. "Output per person in this company is increasing at a rate of 50 per cent to 100 per cent per year," he says. "That means our customers not only get goods with more productive power, but they get them at cheaper prices, every year."

This confidence in the achievements of computers reflects a widely held view among businesses and economists that something revolutionary has happened in restoring the US to its place as the world's leading economic power. Understanding the reasons for US economic success will be high on the agenda of this weekend's summit of leading industrialised nations in Denver.

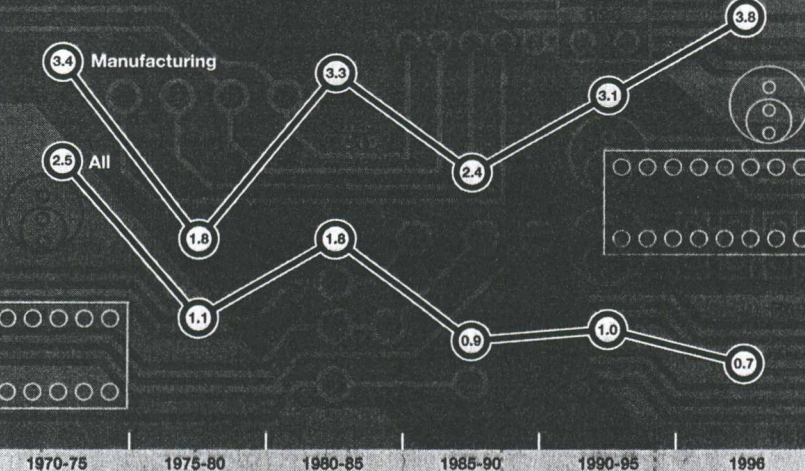
The explanation for this performance in the past few years is generally held to be the so-called productivity miracle, driven by computers, especially in the form of information technology.

Productivity growth is at the heart of economic performance. The long-term capacity to grow is determined by the sum of the growth in productivity and the growth of the labour force – in short, how many workers and how productive they are. If demand in the economy grows faster than this rate of increase, inflation is inevitable. Many economists believe the reason the US economy is now growing at a faster pace than what they have previously regarded as its sustainable non-inflationary rate is that productivity growth has picked up sharply.

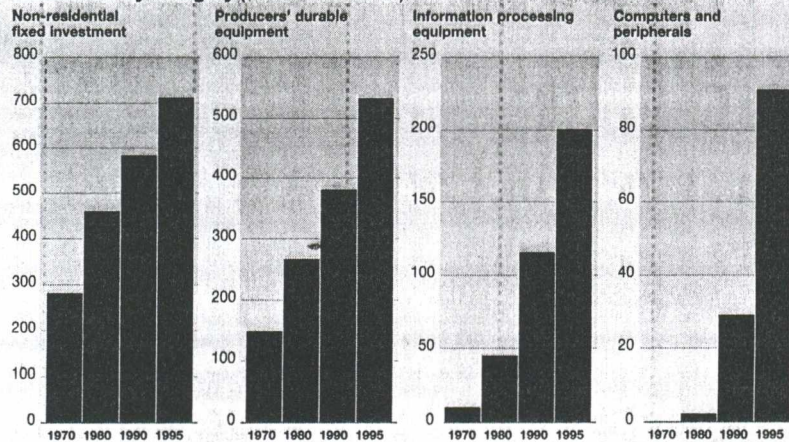
That would certainly explain why the sort of strong growth that has reduced unemployment to a 25-year low in the US has continued alongside an inflation rate at its lowest in 30 years, and why the profitability of US companies has never been higher. The resulting confidence is expressed in a stock market that sets new records almost every week as investors embrace the proposition that the US economy has changed fundamentally.

US productivity: wired up by computers

Output per hour (annual % change)



Investment by category (\$bn at 1992 values)



Sources: Labor Department, Federal Reserve Bank of St Louis

What has happened is equivalent to an "incredible technological revolution", says Mr Allen Sinai, economist with Lehman Brothers, the US investment bank: "The wiring, rewiring and dewatering of . . . private and public infrastructure that has reduced costs and raised productivity almost everywhere."

The only problem with this popular view of the US productivity miracle is that there is still no statistical evidence to back it up. According to the government's official measurements of output in the US economy, productivity in the non-agricultural business sector grew by 0.7 per cent in 1996. Though that represented a slight acceleration from the previous year, it was barely up with the average rate of a little over 1 per cent recorded between 1970 and 1995 and well below the 2 per cent to 3 per cent rates of growth in the 1950s and 1960s.

Officially, therefore, for all the talk of a computer-driven "second industrial revolution" the so-called improvements are no more than an anecdotal mirage. But most economists are deeply suspicious of the official figures. As Mr Robert Solow, the Nobel prize-winning economist, has said: "Computers are everywhere, except in the productivity statistics."

Companies have certainly been investing heavily in technology

in recent years, presumably in the belief that it was fostering increases in productivity. The share of total private non-residential fixed investment that went to computers rose from 1 per cent in 1970 to 12.8 per cent in 1995. While the total value of investment in producers' durable equipment multiplied fourfold in real terms between 1970 and 1995, capital spending on information-processing equipment increased by a factor of 20.

Many economists believe the scale of this investment means the productivity statistics must be wrong. The main problem, they argue, is that the figures fail to pick up improvements in service sector productivity.

Broken down by sector, the figures do indeed suggest there has been a curious disparity between productivity growth in manufacturing and improvements in services. Manufacturing productivity has been rising sharply in recent years with gains of 3.4 per cent in 1995 and 3.8 per cent last year.

That improvement is especially impressive, given the low unemployment rate of just 4.8 per cent. Normally, at this late stage in a jobs-producing expansion, productivity growth falls off as less productive workers are added to the already full payrolls.

Meanwhile in the services sector, growth has stagnated. The

figures suggest productivity improvements in services have been virtually nil in the last 20 years. With an ever increasing share of activity accounted for by services, this stagnation is deeply troubling for the long-term health of the economy.

The problem with these figures, according to many economists, is that increases in the output of many services – and hence productivity – are hard to measure. How is the increased efficiency of a computerised airline ticket reservation system to be measured? "Computers obviously make all of us more productive," says Mr Cattó. "It makes no sense to say that services productivity is static while manufacturing productivity is increasing by 4 per cent or so a year."

But not all economists are convinced the computer-driven improvements in services have been so significant. Though computer-driven technology improvements may have lifted productivity in many high-tech businesses, those companies still represent only a small proportion of overall investment. Mr Stephen Oliner and Mr Daniel Sichel, two US economists, recently estimated that computer stocks accounted for just 2 per cent of total non-residential equipment and structure in 1993. Information processing equipment as a whole made

up about 11.7 per cent. At those levels, even dramatic leaps of productivity in the computer field only slightly affect overall productivity figures.

For all the growth in the use of computers, most services are still heavily labour-intensive. While output – however it is measured – may have increased slightly, hours worked have also risen over the past few years, limiting any productivity gains.

Whatever the explanation for the mystery of the missing productivity miracle, it seems premature to argue that statistical mismeasurement of the figures could really explain the fact that the US economy is experiencing strong growth with low inflation.

The problem is that, if service sector productivity has been understated, then total service sector output will have been understated, too. The productivity numbers are drawn from the overall output figures.

In other words, if productivity has been growing much faster than the 1 per cent or so recorded in the past few years, the total output of the economy will also have been growing faster than the 2 per cent to 3 per cent recorded over that time. That means the economy is still growing faster than its productive capacity to grow, whatever that growth rate may be. "Productivity and output growth are both products of the same data," says Mr Stephen Roach, chief economist at Morgan Stanley, the New York investment bank. "That's because output is defined as 'output per hour'."

What then could explain the impressive US performance? As Mr Ed McKelvey, economist at Goldman Sachs, the US investment bank, says, the question is not whether there is an error in the statistics but whether the error has suddenly grown much larger in the past two or three years.

"The size of the error is much less important than whether it is changing," he says. Only the possibility that the gap had grown larger would provide a convincing case for saying that a productivity miracle had suddenly shifted the economy's productive potential upwards, facilitating a higher rate of non-inflationary growth.

Some economists believe that may indeed have happened – that the surge in investment in computers in the past 20 years may only recently have begun to pay off as workers and management have become used to working with the new technology. Mr Donald Allen, an economist with the Federal Reserve Bank of St Louis, argues that past experience of the introduction of new technology suggests gains do indeed take time to be seen in economic statistics.

"Despite the proliferation of computers and other information technology hardware, there are reasons to believe the capabilities are being under-utilised," he says. But "as computers have become more commonplace, computer literacy has increased".

If that view is correct it would not only explain the benign condition of the US economy; it would also mean the US is set for many years of a much faster growth rate, brought about by technology gains.