Economics focus

Computing the gains
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The economic benefits of the IT revolution are now visible in Europe and Japan

AFTER years of debate about the virtues or vices of the so-called “new economy”, most economists now agree that America has, indeed, enjoyed stronger productivity growth since 1995, thanks largely to investment in information technology (IT). However, many also agree that Japan and Europe, for some reason, seem to have missed out on computer-driven productivity gains. The growth of labour productivity in Japan and most European countries has actually slowed since the mid-1990s. New research, however, suggests that the economic rewards from IT have spread outside America, but have not been measured correctly.

Conventional wisdom has it that Europe and Japan have been slow to invest in IT, partly thanks to rigidities in labour and product markets that reduce the return on such investment. However, Dale Jorgenson, an economist at Harvard University and one of the first to spot the impact of IT on America's economy, finds evidence that IT has boosted growth in Europe and Japan*. His conclusions are based on internationally comparable data and a new method of analysing the sources of growth.

Official statistics tend to underestimate the role played by IT outside America, because of differences in the way it is measured. American statistics count firms' spending on software as investment, so it contributes to GDP. In much of Europe and Japan, most of it is counted as a current business expense, and so excluded from final output. The surge in spending on software in the late 1990s therefore inflated recorded investment and growth in America relative to that elsewhere. A second difference concerns the price deflators used to convert nominal spending on IT equipment into real terms. Official statistics in Japan and many European economies make less adjustment than in America for improvements in the quality of computers, causing an understatement of investment and GDP growth relative to America's.

Mr Jorgenson uses data for Europe and Japan which are adjusted to incorporate price deflators and measures of software expenditure similar to those used in America. Unfortunately, the detailed information needed to make these adjustments is available for most economies only up to 2000. Even so, the results are striking. For instance, they suggest that Japan's GDP grew by an annual average of 2.1% in the second half of the 1990s, compared with only 1.4% according to official statistics.

Employing these revised data, Mr Jorgenson finds that in all G7 economies, not just America, a boom in IT investment helped to boost growth in the second half of the 1990s. Indeed, the contribution to GDP growth from IT capital spending was almost as big in Japan as in America—although it was offset by a fall in investment of other sorts. All of the European economies also saw a marked increase in their IT capital stock, albeit smaller than in America. As in Japan, in many European countries this was partly countered by weaker non-IT investment.

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The second factor that other countries have in common with America is that during the second half of the 1990s all of them, except Italy, enjoyed faster productivity growth—if it is measured properly. The most popularly used measure is labour productivity (output per worker-hour), which slowed in Europe and Japan after 1995. But a better measure is “total factor productivity” (TFP), which captures the efficiency with which both capital and labour are used. Output per worker-hour can be boosted simply by giving each employee more capital to work with, as well as by genuinely improving efficiency. Since 1995, TFP growth has accelerated almost everywhere.

The hard facts about software

Despite all the talk about Japan’s inefficient economy, in the second half of the 1990s its TFP growth quickened to 1.1% a year, much faster than America’s 0.6%. Official statistics imply that Japan was slow to adopt IT. But the internationally comparable data suggest that in the late 1990s the total direct contribution of IT to GDP growth (investment in computers and software, and TFP growth in the IT sector) was roughly the same in America and Japan (see chart). Japan’s GDP growth was slower because of a fall in non-IT investment and weak employment due to deficient demand. Britain, Germany and Canada also enjoyed rates of overall TFP growth close to America’s. Curiously, productivity in the IT sector actually grew faster in Europe than in America, but this was offset by slower TFP growth in other industries.

In other words, America’s growth resurgence due to IT investment is not unique. The snag is that elsewhere it has been partly disguised by the poor performance of investment in other things. What about the period since 2000? Although in the five years before that date virtually all of America’s increase in labour-productivity growth came from either increased IT capital or productivity gains in the IT sector, TFP growth has since quickened in other areas as well. Will this be repeated in Europe and Japan? Recent studies suggest it takes time for firms that invest in computers and software to work out how to reorganise their business practices and to retrain staff in order to reap the full efficiency gains. If so, these benefits may yet appear in Europe and Japan. America was the first big country to embrace IT, so it is hardly surprising that it has been the first to benefit.

The evidence suggests that Europe’s productivity growth in IT-using industries lags behind America’s. Rigid labour markets prevent firms from taking full advantage of new technology, because it is harder to lay workers off. This blocks the reallocation of workers to more productive jobs. But things may not be quite as bad as they seem. Europe’s gradual labour-market reforms are designed to pull lower-skilled, less productive workers back into jobs. Such reforms deliberately make growth more job-intensive and thus in
the short run they are likely to depress productivity growth. In the long run, however, such reforms should boost the rewards from new technology.