

## Economics focus

# Automatic reaction

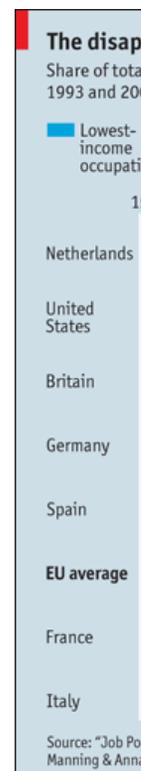
## IT spending has hollowed out labour markets, to the detriment of workers

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AN ODDLY entrancing YouTube video of a robot folding a pile of freshly laundered towels has been viewed over half a million times. Although it does this quotidian task better than any other robot, it is still much less adept than the average person. The difficulty of programming a towel-folding robot which can outdo humans may help to explain why the past couple of decades have been so unkind to middle-class workers in the rich world.

In the 1970s and 1980s employment in quintessentially middle-skilled, middle-income occupations—salespeople, bank clerks, secretaries, machine operators and factory supervisors—grew faster than that in lower-skilled jobs. But around the early 1990s, something changed. Labour markets across the rich countries shifted from a world where people's job and wage prospects were directly related to their skill levels. Instead, with only a few exceptions, employment in middle-class jobs began to decline as a share of the total while the share of both low- and high-skilled jobs rose (see chart). The pattern was similar in countries with very different levels of unionisation, prevalence of collective bargaining and welfare systems. This "polarisation" of employment almost certainly had a common cause.

The development of information technology (IT) is the leading candidate. Computers directly compete with the abstract, analytical tasks that many high-skilled workers perform, increasing their productivity by speeding up the more routine bits of their jobs. But the need for people like assembly-line workers or those doing certain clerical jobs can be reduced to a set of instructions which a machine can easily follow (and consequently be mechanised). At the other end of the employment spectrum



most marked where jobs vulnerable to automation initially predominated.

Although similar patterns of job polarisation have also been documented for European countries, there was until recently no clear cross-country evidence of the importance of IT in explaining them. Filling this gap is a new study by Guy I. Natraj and John Van Reenen of the London School of Economics (LSE), which uses panel data from 11 countries—nine European ones, plus Japan and America—between 1980 and 2004. Across the board, the economists find that industries that grew at faster rates (as measured by their IT spending, as well as their overall spending development) also saw the fastest growth in demand for the most educated workers, while the sharpest declines in demand for people with intermediate levels of education occurred in slower-growing industries.

The authors also find that once the role of technology is accounted for, there is no effect on the extent of polarisation. However, the adoption of IT might be accelerating globalisation. In a paper written with Nicholas Bloom of Stanford University and the LSE, Mr Van Reenen looks at rates of IT adoption within Europe. They compare industries that faced more direct competition from Chinese imports after China joined the World Trade Organisation responded by innovating more in order to move up the value chain. Between 2000 and 2007, 15% of technology upgrading in Europe can be explained as a response to Chinese competition.

### **Polar exploration**

This was good for European productivity but, given the effects of technology, it would also have contributed to the hollowing out of the labour market. Tech firms are moving some higher-end jobs to countries with large pools of highly educated workers. Autor reckons that this is not yet a major factor explaining trends in American wages. But it could become one over time, again altering the relationship between wages and job opportunities.

For now, though, the recession has exacerbated polarisation. In America blue-collar occupations dominated by the middle-skilled shed jobs rapidly between 2000 and 2009. Employment in managerial and professional jobs and low-skilled ones in the service sector grew slightly or fell much less sharply. America's Bureau of Labour Statistics projects that employment in low-skilled service occupations will increase by 4.1m, or 14%, between 2009 and 2018. The only major job category with greater projected growth is professional occupations, which are predicted to add 5.2m jobs, or 17%, over the same period.

For much of the 20th century, people's job prospects rose with each extra bit of education they got. Now the choices, like the labour market, have become more polarised. The solution is to try to get more people to complete school. But that may not be enough. If a

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