# Help wanted: How disruptive technologies could affect labour markets

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UOB Asset Management

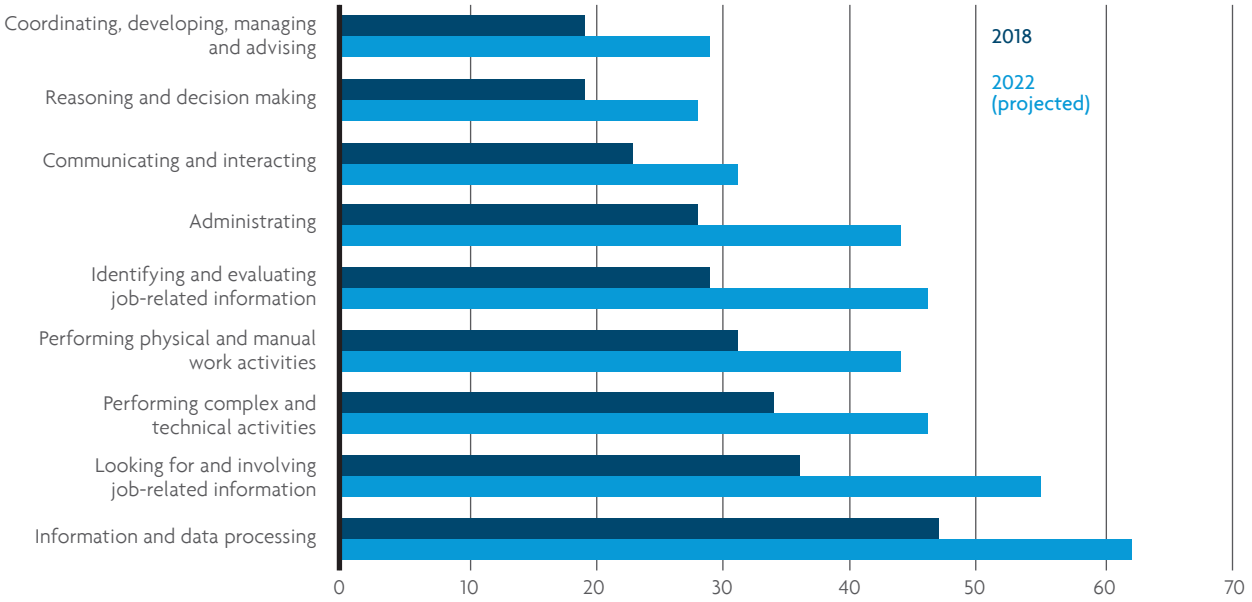
Innovation and disruptive technologies are impacting many aspects of life. What effects could machine learning and other new technologies have on labour markets and economies? We explore the potential implications.

Across labour markets, advances in robotics and artificial intelligence (AI) have been met with trepidation, exposing an underlying fear that efficiency gains generated by these innovations may come at the cost of human jobs. A recent Pew Research Center study revealed that large majorities of individuals in countries around the world believe that robots and computers will "definitely" or "probably" do most human work in the next 50 years[1].

While anxiety about an imminent takeover by robots may be overblown, the accelerated adoption of new technologies in various industries is hardly disputed. The World Economic Forum's The Future of Jobs Report 2018, which projects the degree that machines are expected to do more human tasks over the next five years (Figure 1) shows no let-up in the displacement of jobs with machines expected to do more than 60 per cent of information and data processing jobs in 2022.

Figure 1

**Machine working hours to increase across all job functions**
%, ratio of machine to human hours




Source: World Economic Forum, The Future of Jobs Report 2018

## Market and economic implications

The impact of machine learning and other new technologies on labour markets and economies is an enormously complex question, but we see some concrete implications.

**Business relocation.** A 2018 World Economic Forum survey found that many global firms are willing to change locations and move supply chains to find and secure available skilled labour, irrespective of labour costs, industry concentration, or local market share[2]. Shortages of skilled workers are becoming drags on economic growth in places with tech-heavy gross domestic products (GDPs), including Germany[3].

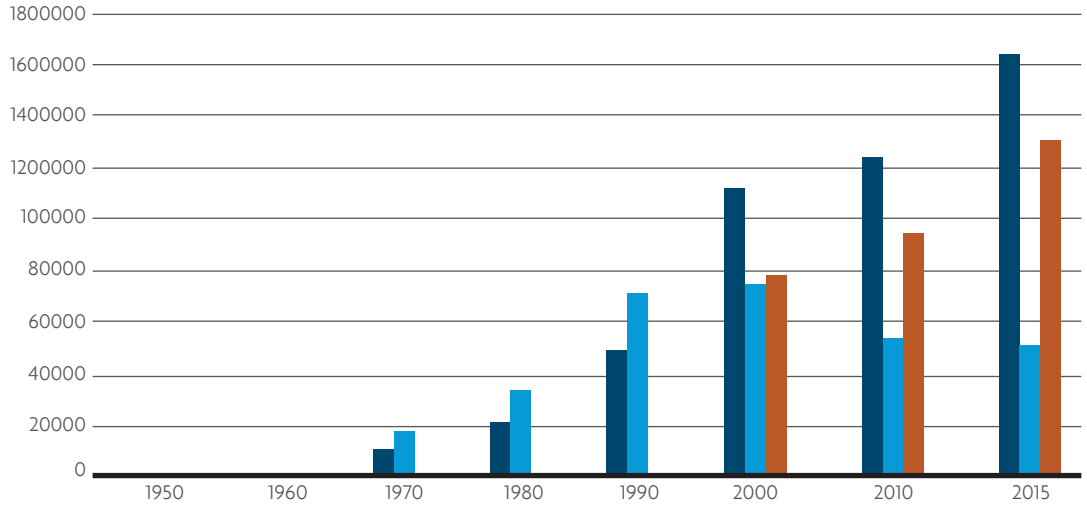
**Jobs gains in certain industries...** As with prior periods of rapid technological advancement, some industries will see a lot of job increases, including the creation of new occupations that complement emerging innovations. Tasks that rely on social intelligence, creativity, perception, and manipulation are areas where humans will likely retain an edge for decades; and health care, professional services, and business service professions should continue to command larger shares of the employment pie.

**...Job losses in others.** At the other end of the spectrum, certain types of jobs will be lost. In the United States, while jobs in computer science and software and systems development are still rising, the number of basic computer programmer jobs has been falling (Figure 2). Some of these jobs have been outsourced to other countries, while others have simply been replaced by software.

Retail is another example where jobs will be displaced. So far, the growth of brick-and-mortar retail categories such as off-price apparel, dollar stores, auto parts, and home improvement have helped offset the decline in department stores, general apparel, and office supplies. During the next recession, however, we believe retail jobs will flat-line, while ecommerce-related retail jobs are likely to continue to expand, with employment in warehousing, storage, and express delivery flourishing.

Figure 2

## Computer and software-related occupations
US. number of workers




Source: ITIF analysis of IPUMS occupation data

**Flatter, longer economic cycles.** The net effect of technology's uneven impact on employment is the creation of longer, flatter cycles that may necessitate fewer countercyclical policy actions, such as interest-rate hikes. As growth in one area is offset by stagnation or shrinkage in another, the economy may experience longer periods of plodding, steady expansion.

**Wage increases are slow to materialise.** The wages of routine "blue-collar" workers, whose jobs can be supplanted by machines may be increasingly pressured. At the same time, the wages of "white-collar" workers have been slow to edge up as well, amid the overall pace of change brought about by technology and the rise of the gig economy. Although the tight labour market of the past few years has resulted in an aggregate drop in "contingent" workers like independent contractors, on-call, or temp agency help, 50 per cent of contingent workers say they prefer full-time, non-contingent employment[4]. The result is a labour market that takes longer to tighten and lead to wage increases.

**Rethinking productivity.** In the near term, we expect the primary focus of technological adoption would be on augmenting current worker productivity, rather than outright worker replacement. Amid new skill requirements, training and retooling will be required in many cases, and while certain occupations will be displaced, the workers that remain may be more productive. Eventually, the persistence of a tight labour market does tend to make companies more willing to retrain and invest in workers.

**More saving, less borrowing.** Individuals who are worried about switching occupations or upgrading skills may feel less secure and therefore compelled to increase saving rates or take on less debt. From a policy perspective, finding solutions for health care coverage or retirement saving "safety nets" may become more urgent.

**Re-emphasis on education.** Prioritising education is slowly starting to gain traction as a policy imperative. Community colleges in the US have been taking steps to improve curricula amid falling enrolment and the inability of many graduates to earn incomes that justify the cost of their degree. Schools that offer education and training in technical skills, coding, software, business management, and sales may attract more students. Companies that partner with educational outlets may appear more attractive to workers.

Information technology and automation have been disrupting labour markets and economies for decades and will, in all likelihood, continue to do so. Our view is that investors can make better decisions if they take the uneven implications of these disruptive forces into account — across industries and in aggregate — as the impacts will be felt in the near term and farther out.

[1] "In Advanced and Emerging Economies Alike, Worries about Job Automation," Pew Research Center, September 2018.
[2] "The Future of Jobs Report," World Economic Forum, 2018.
[3] Institute for German Economy (IW), April 2018.
[4] US Bureau of Labour Statistics, Contingent and Alternative Employment Arrangements Supplement, June 2018.

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