

Going Digital: The Future of Work for Women



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Many believe that the ongoing digital transformation will strengthen the position of women in the labour market. More flexible ways of working may make it easier to combine paid work with caring responsibilities which are still more often taken on by women; automation is also more likely to replace less skilled jobs, giving women an advantage since they now outperform men on most measures of educational attainment.

However, a closer look at the evidence suggests a mixed picture. Women and men have just as much to gain and fear from new digital technologies. Women may benefit from increased flexibility in work but the unscrupulous use of new atypical work arrangements may also reduce job quality. Automation has so far been most common in sectors like agriculture and manufacturing, where men dominate. But in the future, automation is expected to spread, albeit to different degrees, across all sectors and most occupations, including those traditionally dominated by women, such as retail trade, food and beverage services. In addition, jobs are likely to grow the most in business services, health, education and social services – many of which have been traditionally female-dominated. At the same time, persistent gender differences in field of study may mean that women will benefit less from the new job opportunities in STEM-related occupations.

Whether digitalisation will close or widen gender gaps in the labour market will, to a large extent, depend on policy. Governments therefore have a crucial role to play. This policy brief discusses the possible impact of digitalisation on women and men, and proposes a range of policies to ensure that technological change supports a closing, and not a widening, of gender gaps.

More flexibility in work can increase women's employment, but also raises concerns about job quality

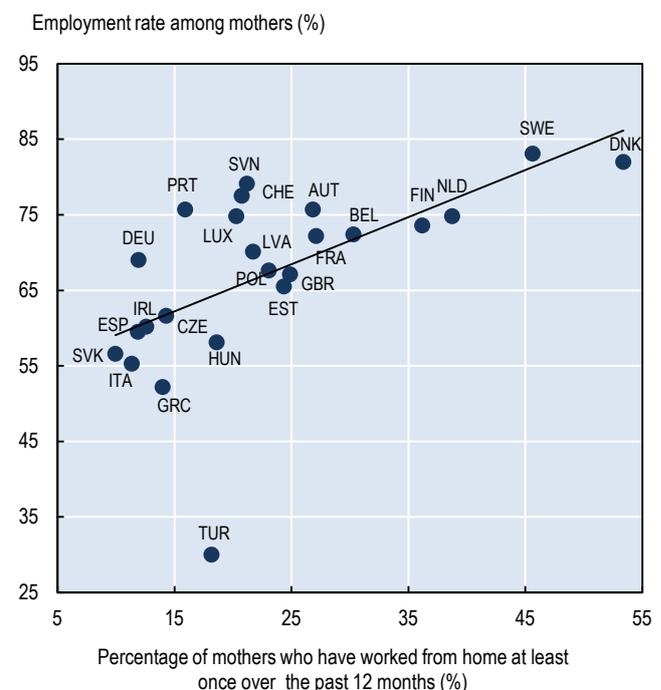
Flexibility and choice in where, when and how to work can be beneficial to women and, in particular, may boost their employment rates. For example, countries with the highest shares of women working from home also have the highest maternal employment rates (Figure 1) - while no such relationship emerges for men. Moreover, evidence from the United States shows that gender pay gaps tend to be lower in industries where working

arrangements are more flexible (Goldin, 2014). Those are typically industries where work can be split into self-contained tasks and allocated to multiple workers without requiring each one of them to work long and inflexible hours.

However, these benefits may be offset by lower job quality. OECD work shows that well-being suffers when the demands placed upon workers by employers are not in line with the resources at workers' disposal (OECD, 2014). If more flexibility results in increased working hours and problems in separating work and personal life, the bottom line may simply be greater stress. Whether such flexibility ends up being good or bad for workers will depend on whether it is: *i*) voluntary or not; *ii*) associated with more or less work autonomy; and *iii*) paired with more or less job security.

Figure 1. Greater work flexibility goes hand in hand with higher employment rates among mothers

Employment rate among mothers vs. percentage of mothers who have worked from home at least once over the past 12 months^a, 2014/2015^b



a. Women with at least one child aged 0-14.

b. Data on home working refer to 2015. Data on maternal employment refer to 2014, except for Denmark and Finland (2012) and Germany and Turkey (2013).

Source: OECD Family Database, <http://www.oecd.org/els/family/database.htm>, and OECD calculations based on the 6th European Working Conditions Survey (2015).

The impact of digitally-mediated platforms on gender gaps is still unclear

“Non-standard work”, such as part-time, temporary or self-employment, is not a new phenomenon; it already accounts for about one in three jobs across the OECD (OECD, 2015a). But new digital technologies and applications are allowing more freedom in where and when work is carried out.

The rise of the platform economy, while fast, still affects only a small share of workers: in 2015 an estimated 0.5% of US workers provided services through online intermediaries (Katz and Krueger, 2016). Most workers participate in the platform economy to supplement incomes from other paid work and to balance family responsibilities - which are still taken on predominantly by women. In the United States, for example, the proportion of female drivers is higher for Uber (14%) than for traditional taxis (8%). Women (42%) are more likely than men (29%) to say that their main reason for driving with Uber is that they “can only work part-time or flexible schedules” because of a “family, education, or health reason” (Hall and Krueger, 2015).

However, the very high turnover of platform workers suggests that such work may be associated with lower job quality. One study found that more than half of online platform participants quit within 12 months, and that women were more likely to drop out than men: 62% and 54%, respectively (JPM, 2016). Older, male workers making less income and who experienced at least one month of non-employment were more likely to stay attached to platforms.

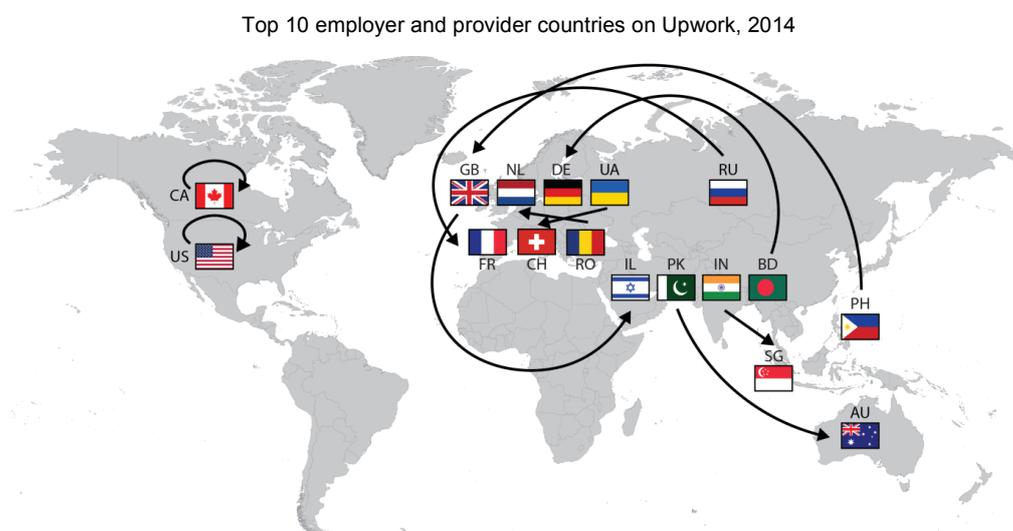
Other aspects of platform work, however, may be more beneficial to women. For example, online job platforms have an international reach and can

provide opportunities for women to work and exit from the shadow and grey economy in countries where cultural barriers or rules make it difficult for them to work in the formal economy. As shown in Figure 2, workers providing services on online platforms appear to be mostly located in low-income countries while employers are mainly based in high-income ones. However, policy must ensure that online platforms do provide real opportunity, rather than substituting a traditional sweat shop for a digital one.

A recent Facebook, OECD and World Bank survey of online entrepreneurs operating on Facebook found that women-run firms exceeded the percentage run by men in Australia, Canada, the Philippines, the United Kingdom and the United States, and tied with men in Thailand (OECD, 2017a). And, in contrast to the offline world, female entrepreneurs on Facebook had, on average, similar business confidence scores as men - while in Malaysia and the Philippines women tended to be significantly more optimistic (OECD, 2017a). The study concluded that digital businesses may help level the playing field for women and men since customers can be reached across the world and cultural norms are avoided.

So far, however, women do not appear to be more present in the platform economy than men. On the contrary, United States data indicate that most of the participants in the online platform economy are men (JPM, 2016), although women are a majority on Etsy (89%), a large sales platform for self-made goods, as well as on Airbnb (67%) (MBO, 2015). Similarly, in the United Kingdom, an estimated 69% of gig workers are male (RSA, 2017). How technology-induced flexibility will influence gender gaps therefore remains to be seen.

Figure 2. Digital service workers on online platforms are mostly located in low-income countries



Notes: Upwork is one of the leading global freelancing platforms. Top 10 employer (provider) countries are denoted by their flags and two-digit international codes. Circular arrows denote flows where employer and provider countries coincide.

Source: OECD (2016a) based on Upwork, 2015.

Automation is expected to spread across most sectors and occupations, affecting both men and women

Digitalisation is creating job opportunities in new industries (e.g. platform-based services and digital products) and new occupations (e.g. software developers, data analysts, medical imaging specialists, bloggers, and others) (OECD, 2016b). But it also leads to job losses, as more and more tasks traditionally performed by humans are either automated or off-shored, or both. Already, the occupational structure is becoming more polarised in many countries, with job losses primarily in middle-skilled routine occupations, and job creation in both high- and low-skilled ones (Autor et al., 2006; Marcolin et al., 2016; OECD, 2017b).

Looking ahead, it has been estimated that 9% of jobs are at high risk of automation in OECD countries (i.e. over 70% of tasks in those jobs could be automated), and that an additional 25% of jobs could change significantly as many (between 50 and 70%) of the associated tasks could be automated (OECD, 2016c).

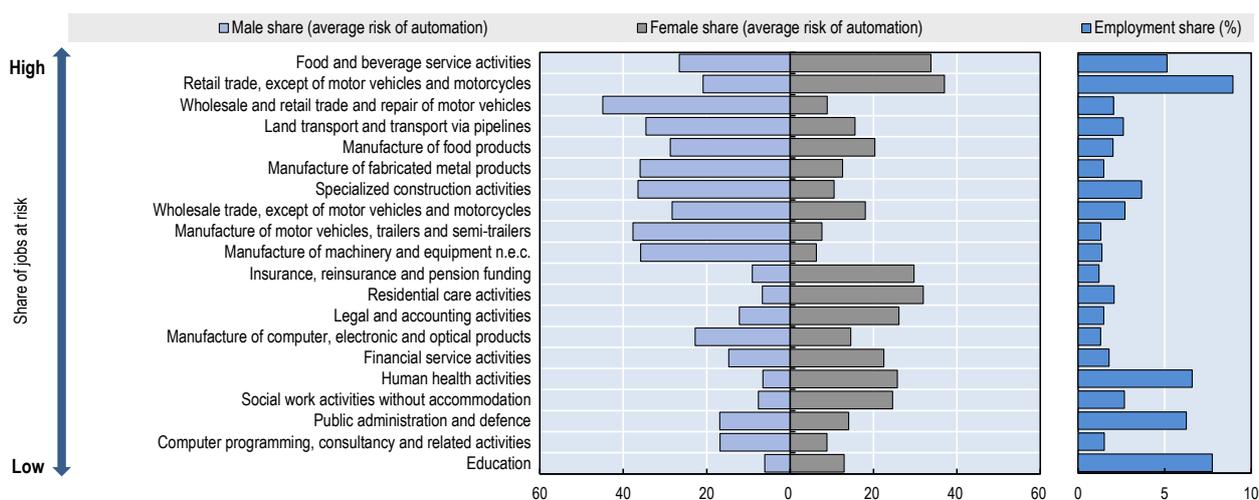
While the risk of automation has traditionally been associated with manufacturing, and therefore primarily male jobs, further OECD analysis shows a mixed and more balanced picture. Some large industries with high shares of women are at a high average risk of automation: food and beverage service activities, and retail trade (Figure 3). Men, in turn, dominate in industries like manufacturing, construction and transportation where the average risk of automation is also high. Other female-

dominated sectors, such as education, social work and health care have a lower risk of job automation; but since many women work in these large sectors, the absolute number of female workers at risk of being displaced is still high. Summing across all industries, the average risk of automation is similar for men and women.

Being at risk of automation is not the same as actual job loss. First, adoption of new technologies is often slow due to economic, legal and societal hurdles. For example, even though the technology for driverless cars already exists, a host of legal, ethical, safety and social reasons explain why robots have not yet replaced drivers. Second, history shows that workers have adapted to major changes during large technological revolutions by changing the tasks that they perform at work, thus avoiding mass technological unemployment. This has been the case of bank tellers, for example, following the introduction of automated teller machines (ATMs). Evidence for the United States shows that, while the number of ATMs rose, so did the number of bank tellers – who evolved from performing routine transactions to becoming part of the “relationship banking team” focused on problem solving and marketing (Bessen, 2015). Third, while innovation may reduce labour demand and raise unemployment, at least in the short run, it also triggers automatic market adjustments working in the opposite direction, such as the production of new digital goods and services; higher consumption of non-digital products following lower production costs and prices; as well as higher investment in digital technologies across sectors (OECD, 2016d).

Figure 3. The average risk of automation varies by industry

20 industries with the greatest number of jobs at risk (29 OECD countries/regions)



Notes: The chart shows the 20 industries with the greatest number of jobs at risk (measured as the average risk of automation weighted by the employment share of the industry), in descending order of overall risk of automation (left panel). The width of each bar in the left panel represents the average share of jobs at risk in each industry. The placement of each bar relative to the centre line depicts how that risk is shared between men (light blue) and women (grey). Values in the right panel represent the share of total employment held by each industry. Risk of automation values are based on likelihoods calculated in Arntz et al. (2016). Countries covered in this analysis include the 29 OECD countries that participated in the first and second rounds of the Survey of Adult Skills.

Source: OECD Secretariat calculations based on the Survey of Adult Skills (PIAAC, 2012, 2015) and Arntz et al. (2016).

The job effects of digitalisation will depend crucially on skills

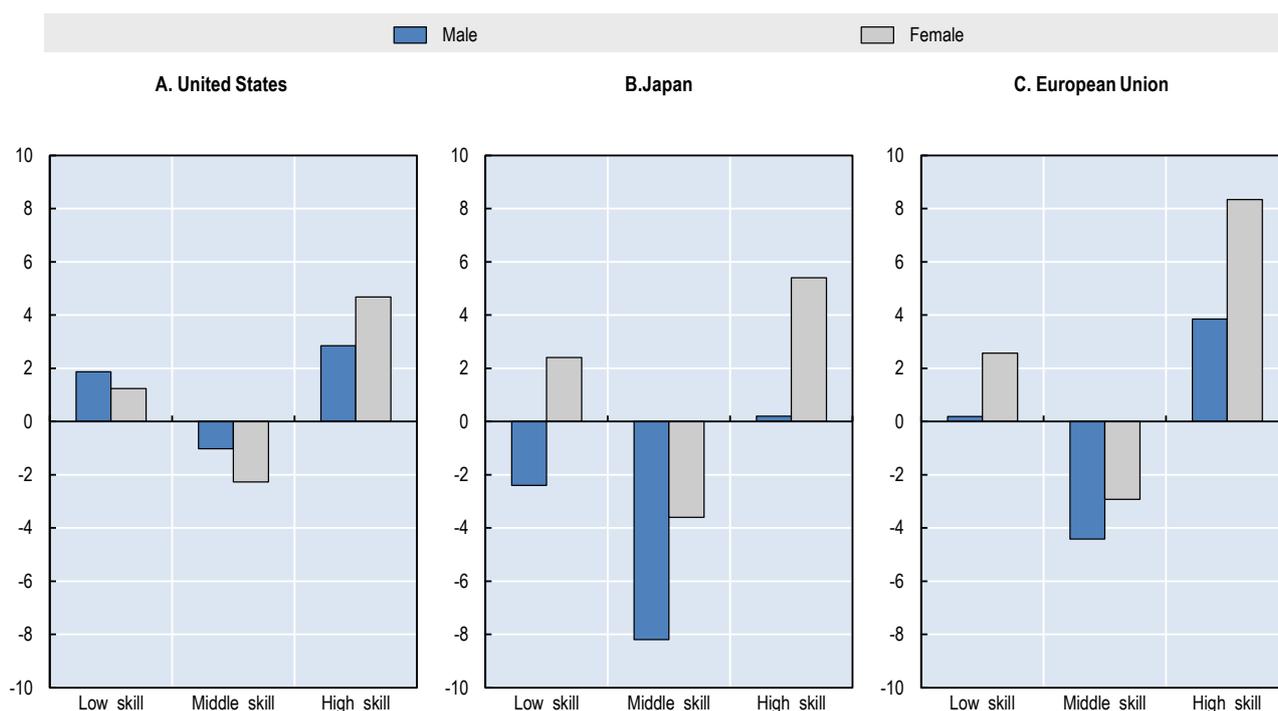
Skills provide an important safeguard against the risk of automation. Fewer than 5% of workers with a tertiary degree are at a high risk of losing their job due to automation, on average, compared to 40% of workers with a lower secondary degree (Arntz et al, 2016; OECD, 2016c). This is good news for women. Across OECD countries, more women than men are now tertiary graduates (OECD, 2016d). Indeed, looking at the type of jobs gained and lost over the last fifteen years, shows that most job growth has been on the high-skill end, and that women have benefited from this more than men (Figure 4). This is true in the United States, Japan, as well as in Europe as a whole. Similarly, jobs in the middle of the skills distribution have declined in absolute terms in all countries, but the gender distribution of losses varies by country. Everywhere, more women now also work in low-skilled jobs. In the United States, a

larger share of the growth in low-skilled jobs has gone to men, while the opposite is true in Europe. In Japan, the number of men in low-skilled jobs has declined.

“Soft” skills are also likely to grow in importance in the new world of work. Evidence from the United States shows that the ability to work in teams, problem-solving and communication skills will be particularly sought after (Deming, 2015). Occupational forecasts for the United States estimate that the demand for home health aides, physician assistants, nurse practitioners and other socially-skilled healthcare professionals will increase by 30-40% by 2024 (BLS, 2015). However, recent OECD analysis (Grundke et al, 2017) shows that gender differences in soft skills, such as self-organisation, management and communication skills, are very small (Figure 5). By contrast, women lag behind men when it comes to quantitative and mathematics-related skills.

Figure 4. Women have gained most from the growth in high-skilled jobs

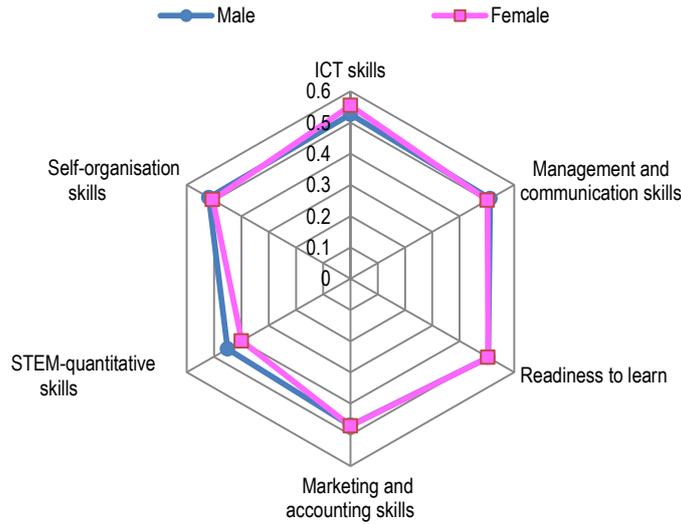
Change in employment levels from 2003 to 2015 by gender and skill level, United States, Japan and European Union (millions of jobs)



Notes: High-skill occupations include jobs classified under the ISCO-88 major groups 1, 2, and 3, namely: legislators, senior officials, and managers (group 1); professionals (group 2); and technicians and associate professionals (group 3). Middle skill occupations include jobs classified under the ISCO-88 major groups 4, 7, and 8: i.e. clerks (group 4); craft and related trades workers (group 7); and plant and machine operators and assemblers (group 8). Low skill occupations include jobs classified under the ISCO-88 major groups 5 and 9, namely: service workers and shop and market sales workers (group 5), and elementary occupations (group 9). European EULFS employment data beyond 2010 are mapped from ISCO-08 to ISCO-88 using a many-to-many mapping technique. Data for Japan is for the period 2003 to 2010 due to a structural break in the data. Data for the European Union includes: Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Latvia, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, and the United Kingdom. Data for Germany is from 2003 to 2013.

Source: OECD estimates based on the European Labour Force Survey, and labour force surveys for Japan (LFS) and the United States (CPS MORG).

Figure 5. Women and men have very similar skills, except for STEM-quantitative skills



Notes: Median values, by gender. Estimates based all countries that participated in the first and second rounds of the Survey of Adult Skills (PIAAC). ICT skills measure proficiency in ICT use such as programming software or navigating the internet.

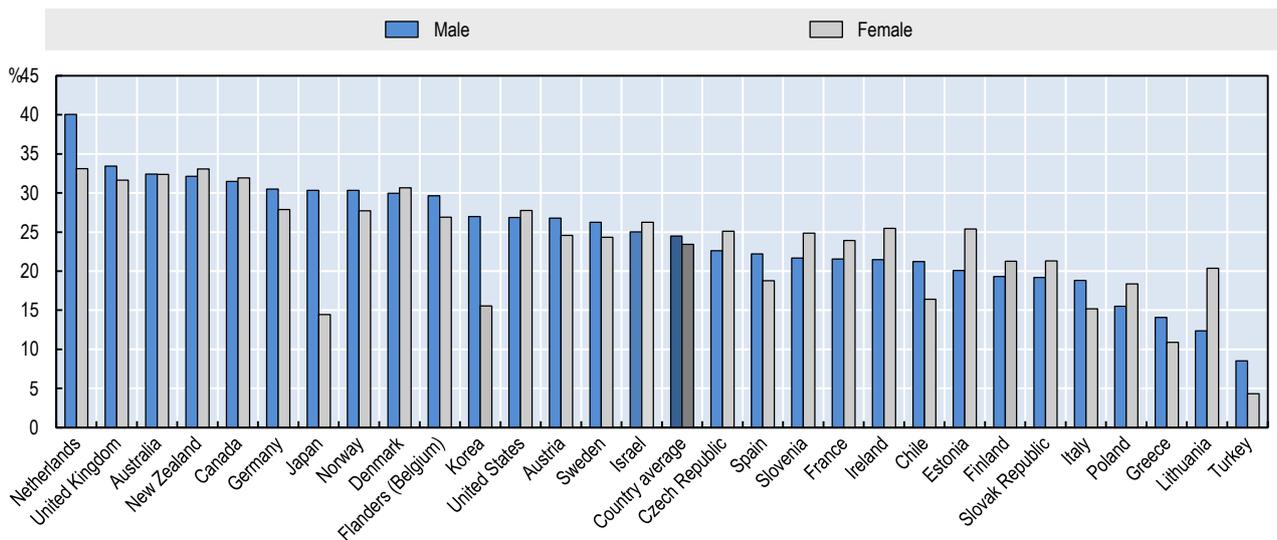
Source: OECD estimations based on Grundke et al. (2017).

While gender gaps in general ICT skills (Figure 5) and the use of software at work (Figure 6) tend to be quite small in most countries, there is a large gender gap in ICT specialist skills: 5.5% of male workers in OECD countries are ICT specialists but only 1.4% of female workers (Figure 7). This gap

needs to be closed. It should be noted, however, that the majority of job growth is likely to be concentrated in business, as well as in health, education and social services (Cedefop, 2016). Most new jobs will therefore not require high-level STEM skills.

Figure 6. In most countries, gender differences in the use of software at work are small

Daily users of office software at work, by gender, as a percentage of all workers (2012 or 2015)

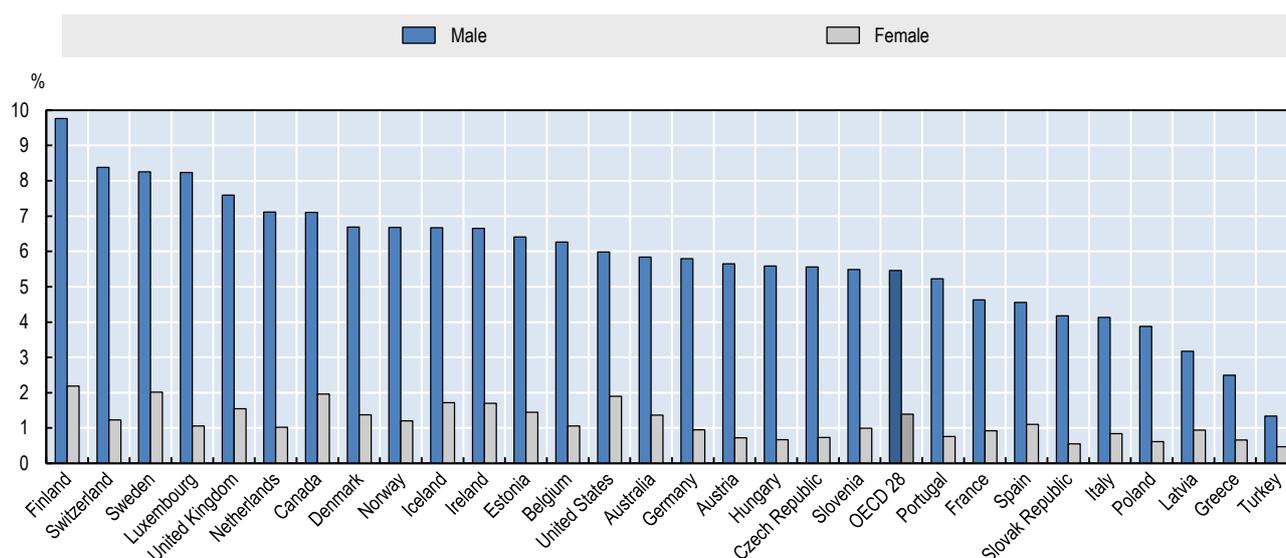


Notes: The data for the following 22 countries from the first round of PIAAC refer to the year 2012: Australia, Austria, Belgium (Flanders), Canada, the Czech Republic, Germany, Denmark, Estonia, Finland, France, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Poland, the Slovak Republic, Spain, Sweden, the United Kingdom (England and Northern Ireland), the United States. Data for the remaining countries refer to 2015 and are sourced from the second round of the first wave of the PIAAC survey. Values for Belgium refer to Flanders only; values for the United Kingdom to England and Northern Ireland only.

Source: OECD calculations based on PIAAC.

Figure 7. Most ICT specialists are men

ICT specialists as a percentage of all male and female workers (2014)



Notes: ICT specialists are defined as individuals employed in “tasks related to developing, maintaining and operating ICT systems and where ICTs are the main part of their job”. ICT specialists’ figures are based on the following ISCO-08 3-digits occupations: 133, 215, 25, 35, 742. OECD aggregate is a weighted average for all countries for which data are available.

Source: OECD (2016b).

Policy can help improve women's labour market prospects in the new world of work

The digital transformation offers an opportunity to lower some of the barriers women in the workforce have been facing. But this will not happen automatically and, without action, barriers could even increase. To avoid this, policy makers will need to:

- ▶ **Promote female participation in STEM.** While women now outperform men in overall educational attainment, they remain less likely to pursue studies in the most specialised STEM fields. Across OECD countries, only 35% of the 2012 tertiary graduates in natural sciences or engineering were women (OECD, 2015b) and, among tertiary graduates in computer science, the share falls to 20%. As a result, women are unlikely to benefit from new job opportunities in engineering, intensive computer and mathematical work and related fields. Gender segregation by field of study and the resulting knowledge gaps in scientific subjects should be addressed by: removing gender bias in curricula and parental attitudes; raising students’ awareness about the likely consequences of choosing different fields of study; and facilitating women's access to STEM-related jobs through apprenticeships. Attitudes and stereotypes can also be affected through the use of role-models, networks and popular culture.

Remove barriers to lifelong learning. Adapting and upgrading the skills and competences of those already in the labour market also calls for urgent policy action. Workers who are most exposed to the risk of automation are the least likely to participate in training: only around 40% of them participate in training each year, compared to 70% of those who are at low risk of automation – with little difference between men and women. For women, adult learning can also help during family-related absences from work (such as maternity leave or eldercare) which, given the speed of technological change, may make the return to work difficult.

- ▶ **Close gender gaps in access to, and in the use of, new technologies.** The job effects of digitalisation also depend on access. About 60% of the world population, many of them women in low- and middle-income countries, still have no access to the internet: 250 million fewer women are online than men; and 1.7 billion women do not own a mobile phone (ITU, 2017). Many women face affordability barriers due to higher levels of female poverty and less access to financial services. Improving access to networks relies on physical factors, such as an adequate power supply; affordable prices require a competitive environment that encourages market entry since entrants

typically introduce the newest technology which in turn improves coverage and lowers prices. National connectivity policies should apply a gender lens to ensure equal access for all. This will also require collecting gender-disaggregated data.

- ▶ **Promote flexible ways of working using new technologies.** Employees and employers can use new technologies to reorganise work schedules and introduce job sharing and home offices. Better reconciliation of work and family life will benefit all workers, but in particular women who in all countries still bear the brunt of family responsibilities and usually work fewer paid hours than men. Employers obviously are key in promoting workplace flexibility, but governments can help by: i) granting all employees a right to request flexible working time arrangements; ii) encouraging social partners to cover flexible workplace practices in collective bargaining agreements; and iii) helping companies change their work organisation through the exchange of best practice and information campaigns promoting a change in the workplace culture (OECD, 2016e). Also, digital technologies, and the flexible ways of working they may enable, could help foster more gender-balanced career paths and thus reduce earnings inequalities.
- ▶ At the same time, governments need to **ensure more flexible ways of working do not lower job quality.** This includes guaranteeing that working time regulations (including minimum rest periods) are respected, that such regulations are reviewed in light of the latest technological developments, and providing guidance for employees and employers on good practices in terms of flexible work arrangements, including training and awareness raising on both the benefits and potential risks. Highly mobile workers, who regularly work outside the employer's premises, report less positive outcomes than other employees regarding their work-life balance, health and well-being at work (Eurofound/ILO, 2017); this group therefore needs special attention.
- ▶ **Ensure gender equality in support for displaced workers.** Policies to cope with the labour market adjustment provoked by digitalisation (and globalisation) may be inadvertently biased against women. For example, schemes for displaced workers often focus on large scale retrenchments in industrial sectors whereas women in the service sector often do not receive such support. Giving all displaced workers access to the same types of

services, regardless of the sector or the size of their previous employer, will help improve re-employment rates for both men and women.

- ▶ **Adapt social protection systems to the new forms of work.** The rise of non-standard employment is challenging traditional forms of social protection which were often built around the male breadwinner in a stable, long-term employment relation. Non-standard workers, and thus many women, are unlikely to benefit from the same advantages as those on standard work contracts. For example, across the European Union, an estimated 46% of self-employed women aged 15-49 are not entitled to maternity benefits (EC, 2015). Tax and benefit systems need to be adapted so that all workers are covered. Portability regulation can prevent the loss of social benefit entitlements when workers move between jobs and countries. In France, an individual activity account has been introduced which attaches rights to training and overtime to workers rather than to jobs; in Germany a similar model is being considered. In the United States, multi-employer plans allow mobile workers to earn and retain their benefits even as they move between employers. Finally, governments may want to expand the role of non-contributory schemes. Several countries are now also experimenting with various forms of basic income schemes.

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