# Women in Work 2020

The opportunities and challenges of the tech revolution
March 2020

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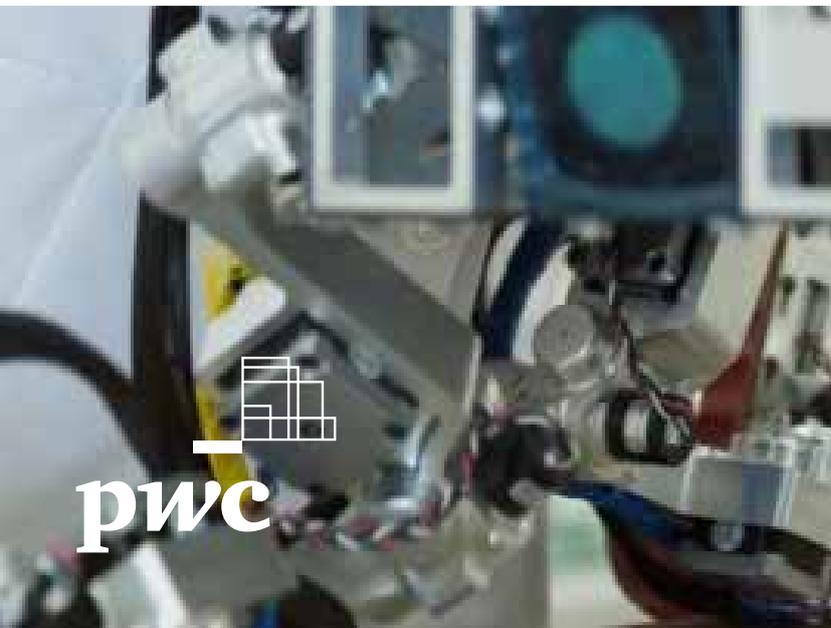
Foreword

International Women's Day 2020 is an opportunity for us to celebrate the successes and continued strides that women have achieved in the workplace. Our Index this year shows that once again, Iceland and Sweden take the top place, while the UK remains in 16th place.

However, while progress has no doubt been made, the pace of improvement remains slow. The World Economic Forum Global Gender Gap Report 2020 projects that on current trends, the global gender gap will take nearly a century to close. Progress has also brought its own challenges: around the world, the backlash against women's rights has been growing, which means that the gains that have been made cannot be taken for granted.[1]

But there is a huge prize at stake from accelerating progress: Our index shows improving female participation in work across the OECD could boost OECD GDP by US$6 trillion, while closing the gender pay gap could boost OECD GDP by US$2 trillion.

The theme of this year's Women in Work 2020 report focuses on the opportunities and challenges that technology presents to women in the workplace.

In the first of our two special articles, we explore how women have been able to take advantage of opportunities in the tech sector across the G7. We find that Canada is the best performing country within the G7 in terms of gender representation and equality in the tech sector.

However, the sector still has a lot of catching up to do compared to others. Despite the large amount of evidence to support the positive impact of diversity on business performance, on average across the G7, women account for only 30% of the tech workforce, and even fewer women occupy the top positions of tech companies.

Examples of the pitfalls of lacking a diverse workforce in the tech sector are abound, from the development of products that don't work as well for women as men (such as smartphones largely designed for male hands), to algorithms that perpetuate gender biases (such as in CV screening software for recruitment purposes).

But there is much that tech companies can do to address this. One of the most important priorities is to build and sustain a pipeline of diverse talent, and in this regard, PwC UK is a proud supporter of the Tech She Can® Charter in the UK, which is campaigning to inspire and educate young girls and women to get into tech careers.

However, the power of new technology can also bring new sets of challenges. AI, robotics and other forms of automation are advancing at a rapid pace, bringing great benefits to the economy, but also a lot of disruption to labour markets. A recent global PwC survey found that more than half of workers globally believe that automation will either significantly change or make their job obsolete within the next ten years[2]. In our second article, we explore in which countries are women most vulnerable to automation, building on our previous research on the impact of automation on jobs,[3] and the potential for female job creation in the future. We find that there could be a small gain to female workers in the OECD, but the distribution of gains and losses can vary markedly across countries and industry sectors.

There is much that policymakers and businesses can do to help people, especially women adapt to technological change throughout their working lives. Governments and businesses can offer workers, especially women, increased training in digital skills and STEM subjects, and support retraining into other jobs in sectors where the "human touch" is crucial. This also means offering opportunities for formal or on-the-job training in softer skills, such as creativity, problem solving and flexibility. PwC can also help business organisations understand which segments of their workforce are more likely to be exposed to automation, and hence provide employees with targeted support to retrain or upskill. With the right interventions, everyone including women can benefit from the gains in productivity from technology and automation.

We hope you find this year's study useful. Please do get in touch if you have further questions or comments about this study, or to discuss how we can help your organisation address these issues.

Jing Teow
Senior Economist,
PwC UK
yong.jing.teow@pwc.com

Alisha Kapoor
Economist,
PwC UK
kapoor.alisha@pwc.com

Alex Cooper
Economist,
PwC UK
alexandra.x.cooper@pwc.com

Tara Shrestha Carney
Economist,
PwC UK
tara.shrestha.x.carney@pwc.com

The Organisation for Economic Cooperation and Development (OECD) continues to make gains to female economic empowerment, but continued progress is needed to achieve gender equality in the workplace

The eighth update of the Women in Work Index provides our assessment of female economic empowerment in 2018 across 33 OECD countries. The Index is a weighted average of five indicators that reflect female participation in the labour market and equality in the workplace.

Between 2017 and 2018, our Index shows the OECD continued to achieve incremental gains to female economic empowerment, mainly as a result of increasing the female labour force participation rate and the female full-time employment rate, as well as reducing the female unemployment rate.

The top **three** performing OECD countries remain the same as last year, with **Iceland** and **Sweden** retaining the top two positions on the Index for the fifth year in a row, and **Slovenia** in 3rd.

Estonia and **Ireland** recorded the biggest decline in their ranking on the Index, both falling by 4 positions mainly due to a decrease in the female full-time employment rate in **Estonia** and a widening of the gender pay gap in **Ireland**.

Czechia experienced the biggest improvement in its ranking on the Index of all OECD countries between 2017 and 2018, rising 4 places from 23rd to 19th, owing to small but positive improvements across all of the indicators in the Index, in particular the participation rate gap and the female unemployment rate.

Belgium and **Poland** recorded the greatest increase in absolute performance, due to strong improvements across nearly all indicators, with **Poland** seeing the largest decrease in the gender pay gap across the OECD.

The top three performing countries remain unchanged, with Nordic countries occupying the top two positions on the Women in Work Index, and Slovenia in third place.

Potential long-term economic gains

- Significant economic benefits can be generated in the long term from increasing the female employment rate to match that of Sweden. The GDP gains across the OECD could be over US$6 trillion.

- Across the OECD, fully closing the gender pay gap could increase total female earnings by US$2 trillion.

2 Sweden

1 Iceland

3 Slovenia

Boost to OECD GDP from increasing female employment rates to match Sweden's

$6tn

Boost to OECD female earnings from closing the gender pay gap

$2tn

Source: PwC analysis, all data sources are listed in the appendix.

Over the longer term there have been significant movements in country rankings, largely due to changes in the gender pay gap, the female unemployment rate and the gender gap in labour force participation.

Since 2000, **Luxembourg** and **Poland** have made significant improvements on the Index, as a result of a substantial reduction in the participation rate gap and the gender pay gap in **Luxembourg** and a large decrease in the female unemployment rate in **Poland**.

Conversely, **France** and **Austria** have both fallen significantly on the rankings since 2000, owing to a widening of the gender pay gap in **France**, and an increase in the female unemployment rate and a substantial reduction in the female full-time employment rate in **Austria**.
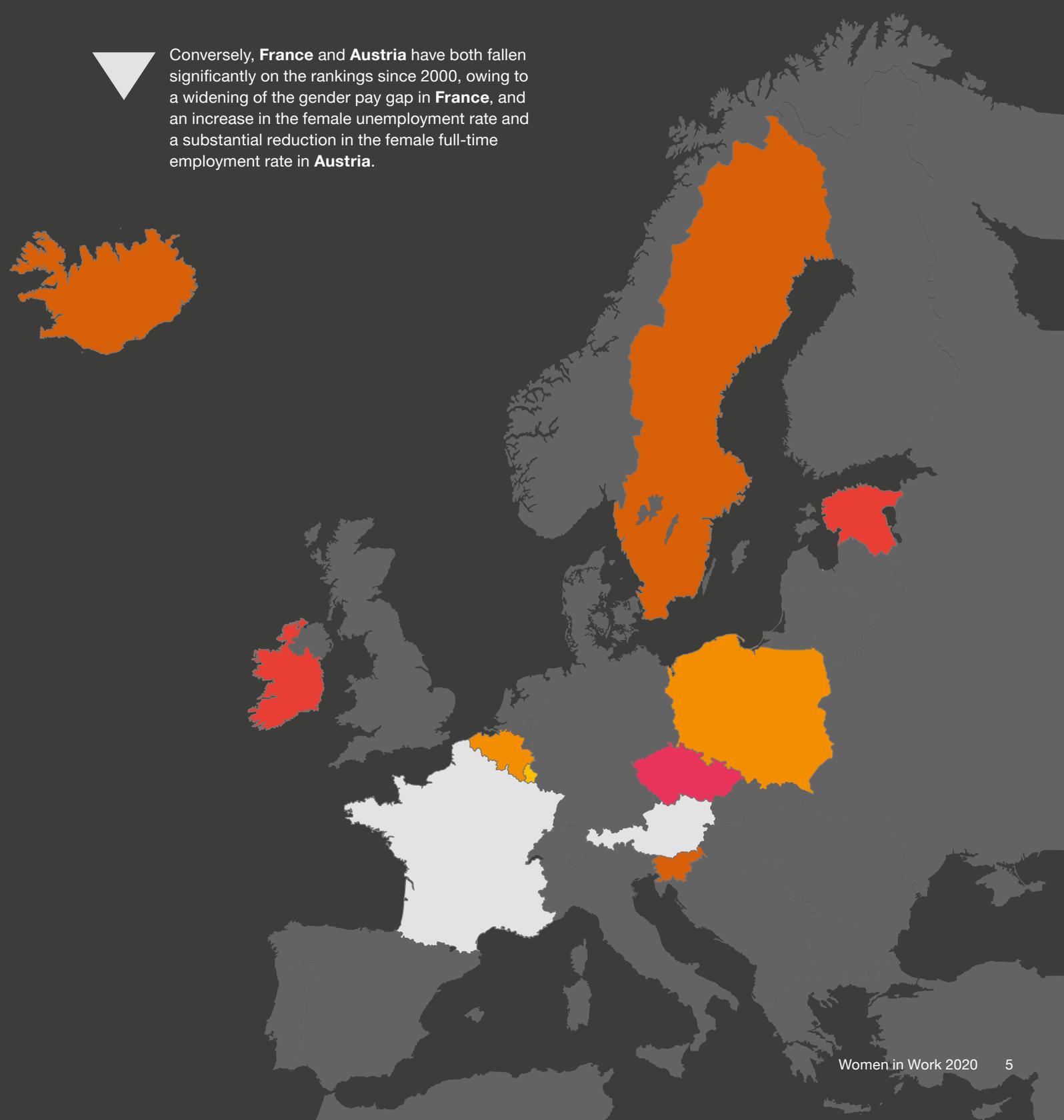
The UK's position on the Index remains unchanged at 16th, but it is increasingly being outpaced by greater improvements elsewhere in the OECD

UK Ranking: #16

The UK continues to perform above the OECD average, but the gap is closing

From 2017 to 2018, the UK charted improvements across all indicators of the Index, except the female labour force participation rate, which fell marginally.

The UK's position has barely budged since 2000 when it stood at 17th position, demonstrating slow progress over the years.

That said, the UK performs better than the OECD on average. Between 2000 and 2011, the UK's Index score was below the OECD average, but it then began to outperform the average from 2012 onwards, pulling away quickly until 2015. However since then, the gap between the UK and OECD has narrowed and the UK's rank has remained the broadly the same, which suggests that improvements made elsewhere in the OECD are outpacing progress in the UK.

The UK performs well when compared to other G7 economies. Overall, it is second only to Canada and performs above the G7 average with respect to all indicators.

Comparision against the G7

Italy	Japan	France	Germany	United States	United Kingdom	Canada
#29	#27	#24	#21	#20	#16	#11
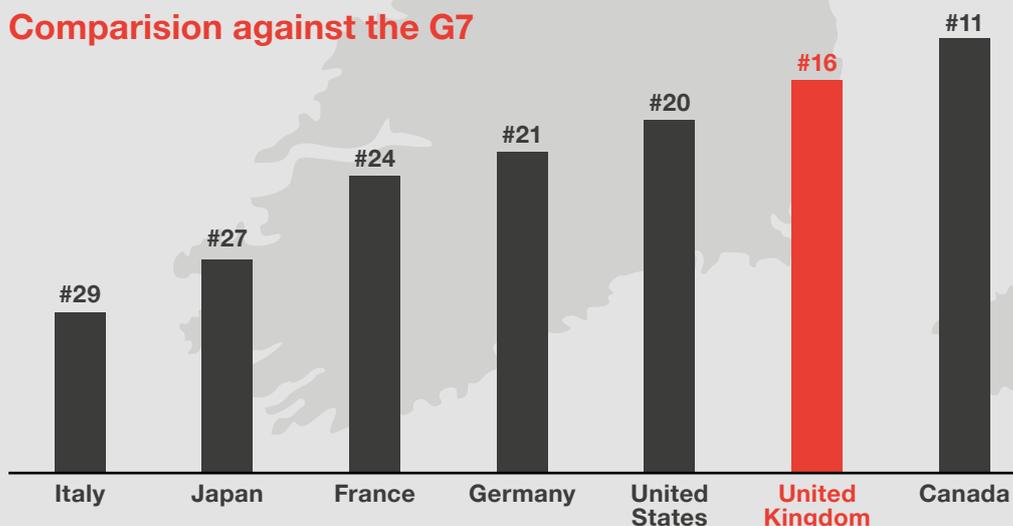
Source: PwC analysis

Women's employment opportunities have improved across the regions, with poorer performing regions closing the gap

This year's update to the UK regional index points to a narrowing of regional inequality in women's employment opportunities

All regions except Scotland have improved their absolute score on the index since last year.

London has fallen three places to 12th as a result of a widening gender pay gap and gender labour force participation gap. It is the region that has achieved the the biggest improvement in its index score since 2010, but progress has stalled more recently.

The biggest improvements in absolute terms have been observed in the poorer performing regions, thus these places are closing the gap with the rest of the UK.

The South West now takes first position, unseating Scotland, as a result of improvements on all indicators, most notably the gender gap in labour force participation and the gender pay gap. Northern Ireland has improved from 4th place to 2nd due to the largest improvement of all regions in its female labour force participation rate, although it still lags behind other UK regions on this indicator.

In particular, the East Midlands, North East and West Midlands have achieved increases in their index score of over 12% since last year, mainly driven by broad-based improvements to female labour force participation and full-time employment rate, as well as the gender pay.

Women in Work regional index score, 2018 and 2017

Legend: ▲ 2017, ■ 2018

Y-axis: 2018 Index score (0 to 40)

Regions (left to right): South West, Northern Ireland, Wales, Scotland, South East, East, North West, North East, East Midlands, Yorkshire & Humber, West Midlands, London
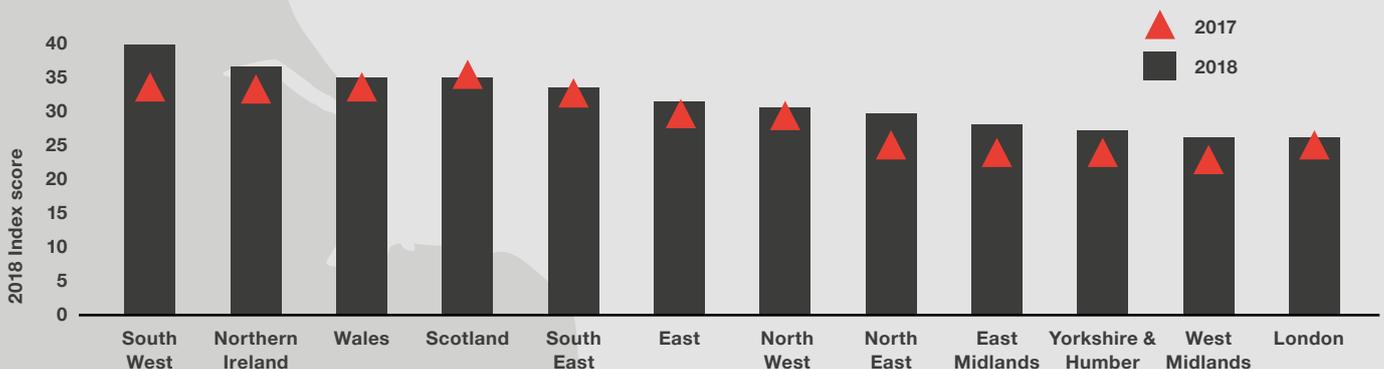
Source: PwC analysis

Biggest movers in the PwC Women in Work Index ranking between 2017 and 2018

	2018	2017	Movement
Northern Ireland	2	4	▲
East Midlands	9	11	▲
North West	7	6	▼
Scotland	4	1	▼
London	12	9	▼
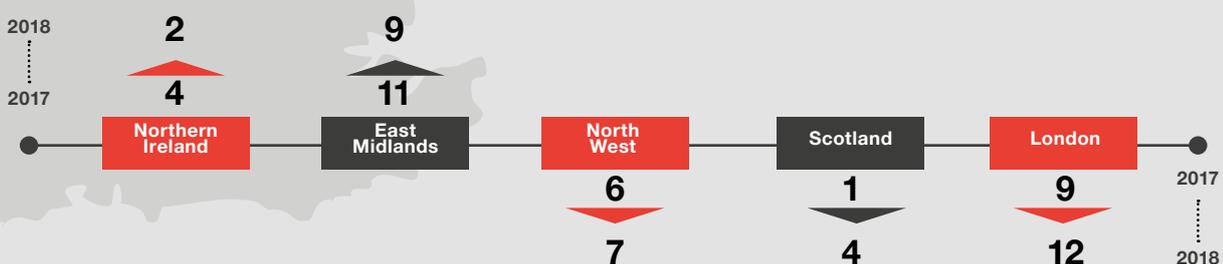
Source: PwC analysis

Women face a number of challenges in the tech sector

Why are women in tech underrepresented, and what can technology organisations do to increase opportunities for women in the sector?

A number of challenges face women throughout their career lifecycle:

Gender stereotypes and a lack of female role models

Women face a number of challenges in entering, as well as staying in the tech sector. Gender stereotypes and biases that technology, both as an occupation and a product, is for men, can contribute to female underrepresentation and gender inequality in the tech industry[4]. They can discourage women from aspiring to a career in tech and acquiring digital skills from an early age, which limits the available pipeline of women seeking careers in tech.

The lack of senior women in tech suggests that women are less visible in the sector, and that younger women also lack the mentorship and networks to provide coaching and advice, and support their career progression[5].

Skills and qualifications

The acquisition of technical knowledge, such as numeracy and STEM-related subjects, is crucial in taking up technical roles in the tech sector. However, women tend to be less equipped with these skills[6], despite no gender differences in ability for learning these skills. This suggests that there are other social and cultural factors at work influencing the take-up of these skills by women.

Workplace experiences for women

Many women join the tech sector to develop their skills through technical roles that enable direct involvement in the development of products and services. However women tend not have the same access to core, creative technical roles as men and are more often clustered into execution and project management roles[7].

Tech firms can foster an environment, which lead to women feeling isolated or lacking a sense of belonging in tech workplaces[8].

Women also often feel stalled in mid-level positions due to the lack of leadership and development opportunities[9], and a lack of mentors, sponsors and informal networks can mean that women's accomplishments are less visible, which can limit progression[10].

However, organisations can take action today to promote opportunities for women and improve female representation in tech

Organisations can implement a range of policies to address these challenges:

Developing the pipeline of female talent

Female role models, and encouraging girls and young women to develop STEM skills and aspire to careers in technology are crucial to developing the pipeline of female tech talent. Tech companies and other public sector and third sector organisations can contribute to this by collaborating with educational institutions to promote and celebrate successful women in technology and educate and inspire pupils and teachers about technology careers.

Attracting women into the industry

Recruiting more women into the technology industry is vital to improving female representation and challenging gender stereotypes. Organisations can help achieve this by ensuring that branding and job descriptions are gender-neutral and that recruitment teams are gender-balanced. Furthermore, setting targets for the number of women on vacancy shortlists is demonstrably effective in improving representation[12].

Fostering an inclusive workplace culture

Promoting inclusivity in the workplace is crucial to attracting, retaining and developing female talent within the technology industry[11]. Organisations can implement a number of initiatives such as mentorship schemes to support career planning, women's networking groups and events to provide a forum for support and discussion, to help organisations better understand the issues women face in the workplace and how these can be addressed. There is also scope for cross-industry learning and the sharing of best practices.

Providing opportunities for development

One way organisations can help address both the pipeline and progression of women in tech is by focusing on training and education. For example, by implementing retraining and returner programmes and creating alternative hiring pathways to allow employees to move into different roles. Learning and development initiatives are particularly important to facilitate progression in the technology industry, as technical roles, and especially those that are senior, often require a high level of skills and specific expertise in order to access them.

Canada leads the way for women in tech in the G7, but all countries have a long way to go to improve gender diversity in the tech industry

More women than ever before are choosing the fast-growing technology industry as a pathway to career success[13]. Our Women in Technology Index provides an assessment of female representation in tech across the G7[14].

On average for the G7:

1 in 5
of ICT graduates are females

23%
Percentage of women on boards in technology, media and telecommunications

30%
Female share of employment in the technology industry[15]

18%
Gender pay gap in the technology industry[16]

Source: PwC Analysis. For further details please refer to the full report.

Similar to its position in the G7 on the main Women in Work Index, **Canada** is the best performing country in the G7 on the Women in Technology Index. This is due to its strong and better than average performance on all indicators except the share of women on boards in the technology, media and telecoms (TMT) sector.

France comes in second place, due to its to better than average performance on all indicators except for the female share of ICT graduates. **France** also has by far the highest share of women on boards in TMT in the G7 (38%).

In contrast to the main Index, on which it is the second best performing country in the G7 and ranks in the top half of the OECD overall (16th), the **UK** ranks in 5th place in the Women in Technology Index for the G7. The **UK's** poor performance on the Women in Technology Index is driven by its worse than average performance on all indicators except the share of women on boards in TMT.

Italy takes sixth, with **Japan** in last place. Both countries' poor performance is due to their below-average performance on most indicators. **Italy** in particular has the lowest female share of ICT graduates, and **Japan** the lowest female share of technology employment and share of women on boards in TMT in the G7.

How does the technology industry compare to the wider economy?

On average, across the G7, the technology industry performs worse than the average for all industries on various measures of equality, particularly on the pipeline measure (the female share of ICT graduates compared to the share of female graduates in tertiary education), as well as share of employment. However, the G7 tech sector appears to be performing similarly to other sectors on female board representation.

This suggests that the tech sector faces a unique challenge on female representation, and that there may be drivers that are specific to, or are more pronounced in, the tech sector.

Women in Technology Index
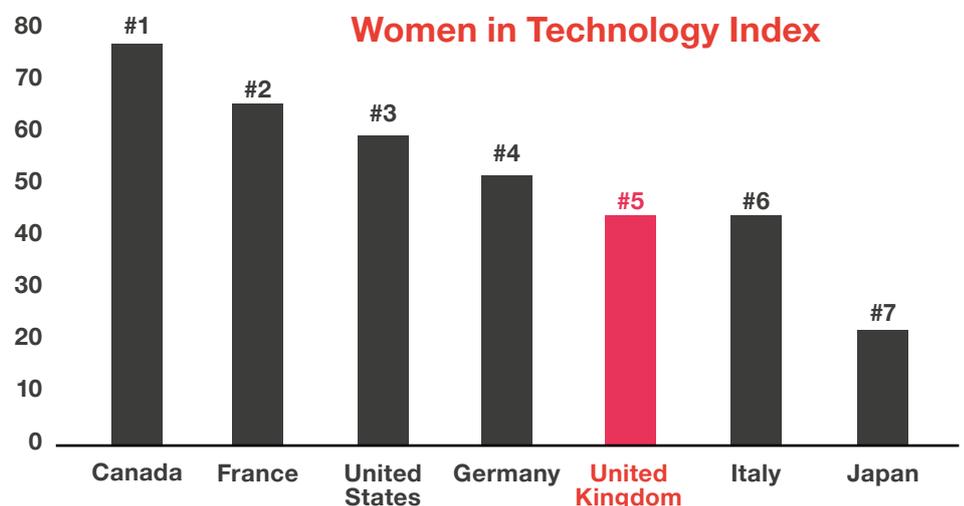
Source: PwC Analysis. For further details please refer to the full report.

Women are less susceptible to automation than men

The growth of advanced technology will present both challenges and opportunities for the labour force. AI and related technologies such as robotics, drones and driverless vehicles could displace many jobs formerly done by humans, but may also create many additional jobs as productivity and real incomes rise and new and better products are developed.

Understanding the different impact that new technologies may have on male and female employment can inform policy to help mitigate disproportional gender-specific effects.

Fewer female jobs are expected to be lost from automation relative to jobs lost for the male population in the OECD.

Our analysis shows men tend to be concentrated in sectors that are more highly automatable, such as transport and manufacturing, while women are slightly less susceptible to automation as they are more concentrated in sectors, such as health and social care and education, which are less automatable.

The gains from the income effect are likely to be bigger for men than women.

Technological adoption can also result in an income effect that counteracts the jobs displacement effect, as tech-driven cost savings improve production efficiency, leading to lower prices and boosting household real incomes. Job creation is more likely to benefit male workers rather than female workers, as high levels of job creation are estimated in the manufacturing sector, which is typically dominated by men. For women, this "income effect" is highest in the human health and social work sector.

The health and social care sector, the largest employer of women in the OECD...

The health and social care sector, as well as the education sector, is expected to experience a small net gain in female jobs resulting from the effects of technology.

The human health and social work sector could see a net increase in jobs (around 3%) for female workers. This is largely driven by the expected rapid growth in the sector as demand for health and social care increases to care for an ageing population and the lower exposure to automatability estimated over the next 20 years.

On the other hand, the number of jobs for female workers in the wholesale and retail trade, manufacturing, and other services sectors, could decline as a result of technology and automation. These sectors collectively account for 30% of female employment currently, and there could be a net loss of around 10-20% of these jobs.

Ultimately, other factors, particularly education, are more important drivers than gender for determining the impact of automation.

Our previous research found that workers with low and medium levels of education have notably higher automation rates across countries, compared to those with higher levels of education.

Education and skill levels are also an important determinant of the types of occupations workers perform, which can also vary significantly in terms of automatability. Some occupations, such as machine operators and clerical workers, are more exposed to automation as these tend to involve routine or simple computational tasks. In contrast, the risk is lower for professionals and managers that require social skills and literacy skills, as well as dealing with more complex computational tasks that are less automatable.

...is expected to experience a net increase in female employment as a result of technology

Net impact of technology on female employment and share of female employment across the OECD

Net long term impact as a share of female employment in 2018

20%

10%

Education

Human Health and Social Work

0%

0%   2%   4%   6%   8%   10%   12%   14%   16%   18%   20%

Other Services

Manufacturing

-10%

Share of OECD female employment (2018)

Wholesale and Retail

-20%
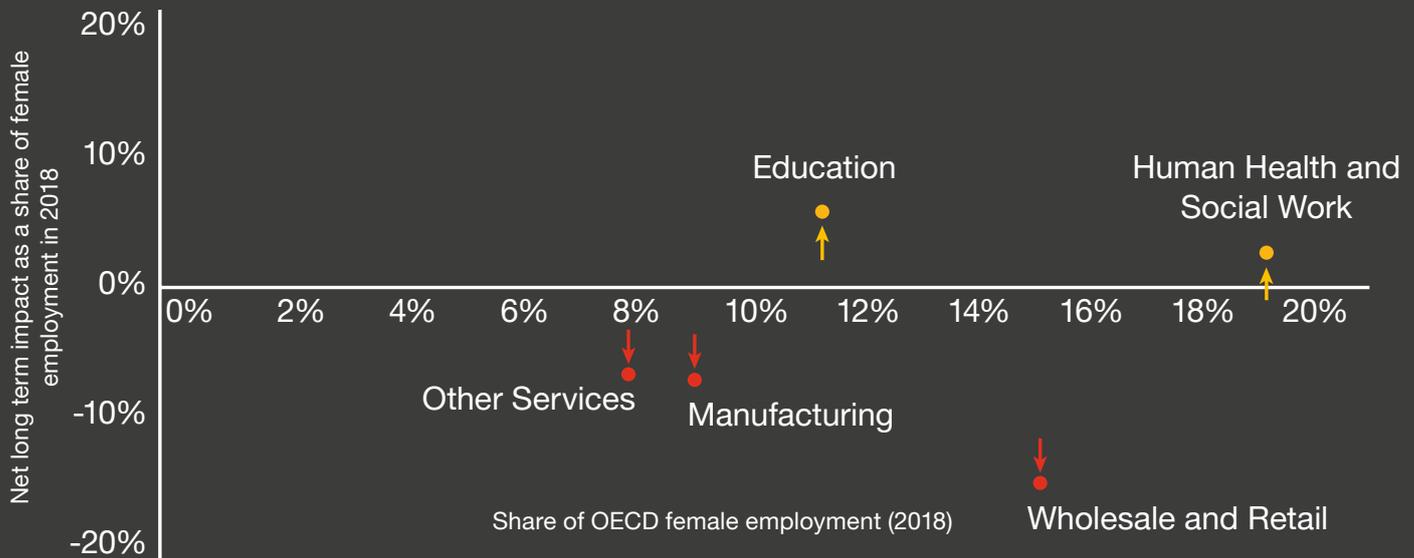
Source: PwC Analysis. For further details please refer to the full report.

With the right interventions, everyone, including women, can benefit from the gains in productivity from technology and automation

Businesses and governments can collaborate to retrain and upskill the workforce to have the skills they need to succeed in the future

Stronger social safety nets can help manage the impact of automation on women and the economy

Effective regulation and competition policy can help consumers benefit from technological advances
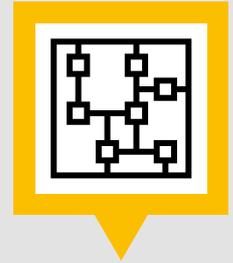
Careful engagement with AI and technology is needed to maximise the potential value from technology, while minimising its negative impacts on workers
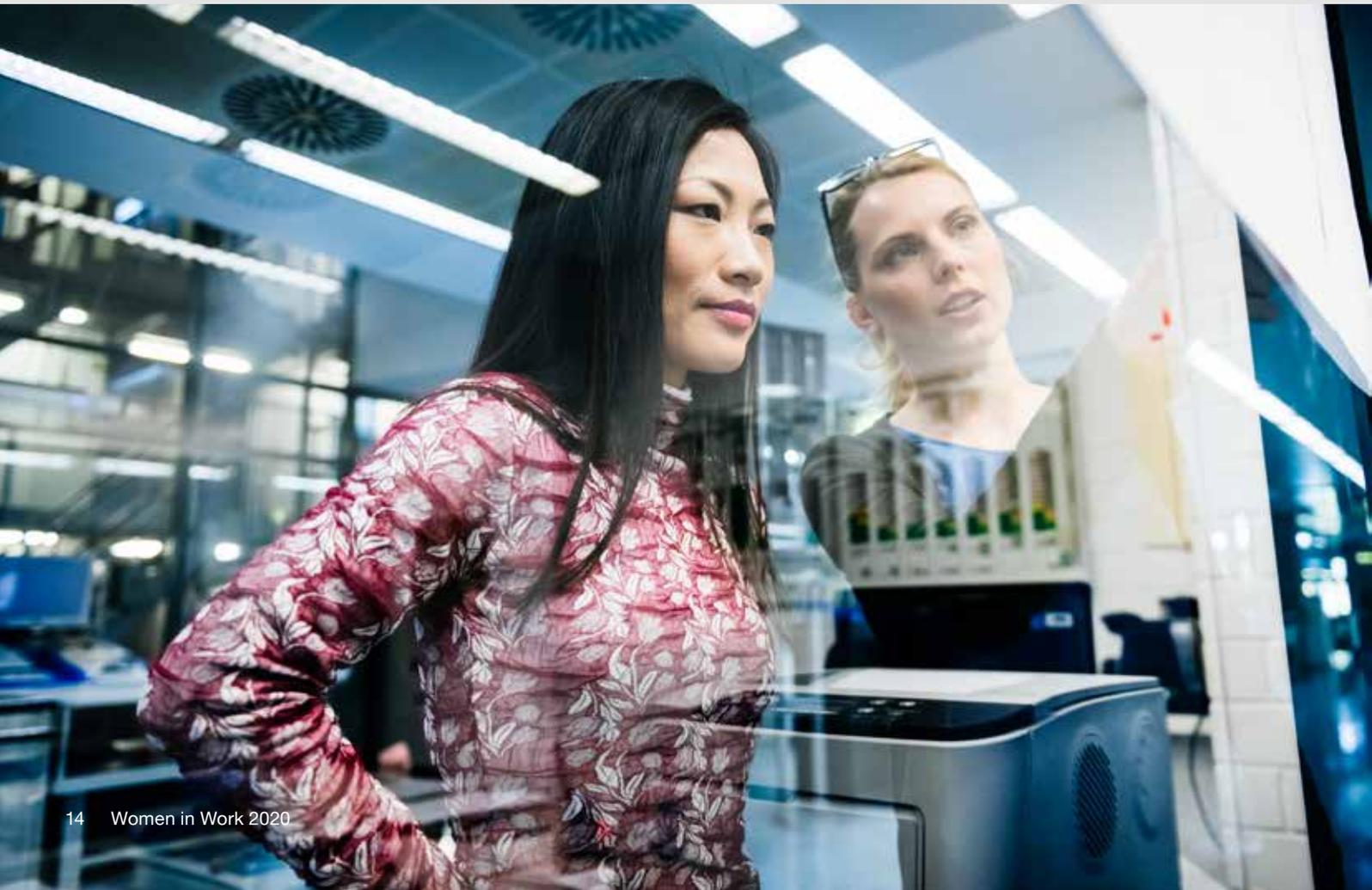
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13. ILO data shows that the number of women employed in the information and communication industry has increased over the period 2014 -2018 (inclusive) in Germany, France, Italy, Japan, the United Kingdom and the United States. Research conducted by The Information and Communications Technology Council in Canada shows that the number of women employed in ICT has increased over the period 2008 - 2018 (inclusive).

14. Throughout this edition of the Women in Work Index, the technology industry/sector/companies/organisations refers to (companies and organisations within) the information and communication industry as this is the industry classification for which data on employment and the gender pay gap is available for all G7 countries and includes a number of technology occupations. Women in technology refers to women employed in all roles in the information and communication industry. Women employed in technical/technology roles in other industries/sectors are not included. Other industries refers to industries other than information and communication.

15. The female share of employment in the technology industry is defined as the number of females employed in the information and communication industry divided by the total number of people employed in the information and communication industry.

16. The gender pay gap is calculated for the information and communications industry for France, Germany, Italy, Japan and the UK, computer and mathematical occupations in the US, and the top 5% of technology occupations based on skills in Canada.

For more information about this report, please contact members of our team

Jing Teow
Senior Economist, PwC UK
yong.jing.teow@pwc.com

Alisha Kapoor
Economist, PwC UK
kapoor.alisha@pwc.com

Tara Shrestha Carney
Economist, PwC UK
tara.shrestha.x.carney@pwc.com

Sheridan Ash
Technology and investments innovation and Women in Tech Leader, PwC UK
sheridan.ash@pwc.com

Alex Cooper
Economist, PwC UK
alexandra.x.cooper@pwc.com

Katy Bennett
Director, Diversity and Inclusion Consulting, PwC UK
katy.e.bennett@pwc.com

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For more information about our Economics services please visit: www.pwc.co.uk/economics

Our Women in Work Index is one of a series of related PwC labour market indices. Please take a look at our other indices for older and younger workers at the links below:

PwC's Golden Age Index
https://www.pwc.co.uk/services/economics-policy/insights/golden-age-index.html

PwC's Youth Employment Index
https://www.pwc.co.uk/services/economics-policy/insights/youth-employment-index.html