



The Pissarides Review  
into the Future of  
Work and Wellbeing

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# Introducing the Pissarides Review into the Future of Work and Wellbeing



Institute for the  
Future of Work

Imperial College  
London



Funded by



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## Citation

Institute for the Future of Work. (2022). *Introducing the Pissarides Review into the Future of Work and Wellbeing*. London: Institute for the Future of Work.

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# The Pissarides Review into the Future of Work and Wellbeing

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## The Review

This report marks the launch of the Pissarides Review into the Future of Work and Wellbeing, a collaboration between the Institute for the Future of Work, Imperial College London and Warwick Business School. The Pissarides Review is a three-year programme of work, informed and supported by an expert Steering Group and funded by the Nuffield Foundation.

The purpose of the Review is to build a better future of work through an improved understanding of the impacts of automation on work, society and the economy. Building on the theory of labour market frictions by Professor Sir Christopher Pissarides, the Review will take a multi-disciplinary approach to examine how, and to what extent, workers are exposed to market ‘frictions’ related to their skills, location and information about the changing world of work.

The Review seeks to create impact across academia, policy and practice by developing new approaches to measure, understand and manage labour market transitions in the UK. It aims to ensure that everyone, whatever their background, can develop their capabilities in ways that will enable them to flourish as the world of work transforms.

Find out more: [pissaridesreview.ifow.org](https://pissaridesreview.ifow.org)

# The Pissarides Review into the Future of Work and Wellbeing

## About

### Institute for the Future of Work

The Institute for the Future of Work is an independent research and development institute exploring how new technologies are transforming work and working lives. We develop practical solutions to promote people's future wellbeing and prosperity. Co-founded by Nobel prize winning economist Sir Christopher Pissarides, technologist Naomi Climer CBE and employment barrister Anna Thomas, we work at the intersection of government, industry and civil society to shape a fairer future through better work.

Find out more:  
[ifow.org](http://ifow.org)  
[@FutureWorkInst](https://twitter.com/FutureWorkInst)

### Nuffield Foundation

The Nuffield Foundation is an independent charitable trust with a mission to advance social well-being. It funds research that informs social policy, primarily in Education, Welfare, and Justice. It also funds student programmes that provide opportunities for young people to develop skills in quantitative and scientific methods. The Nuffield Foundation is the founder and co-funder of the Nuffield Council on Bioethics, the Ada Lovelace Institute and the Nuffield Family Justice Observatory. The Foundation has funded this project, but the views expressed are those of the authors and not necessarily the Foundation.

[www.nuffieldfoundation.org](http://www.nuffieldfoundation.org)

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# 1. The transformation of work in the UK

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**Work is at the centre of people's lives and wellbeing. It is the thread that connects our everyday experience with local communities, the state and markets, public policy and private investment.**

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Before the pandemic struck, the world of work was going through one of the greatest technological transformations since industrialisation, variously called the 'rise of the robots',<sup>1</sup> the 'second machine age'<sup>2</sup> or the 'fourth industrial revolution'.<sup>3</sup> The impact of COVID-19 has superimposed further disruptions, related to public health and wellbeing.

We are now at a critical juncture in which the need to re-examine the changing nature and role of work for people and society.

The pandemic has highlighted the importance of access to good quality, safe and secure work, and the value of human skills and human contact. As the country emerges from the circumstances of the pandemic, we have come to realise the particular importance of good work following health and economic shocks, to promote wellbeing and build resilience through transition.<sup>4</sup> As we look beyond COVID-19, the ambition to create and sustain future good work offers a vision for recovery to benefit people and communities across the country.<sup>5</sup>

In reality, we have seen a growth in poor quality work, characterised by higher levels of insecurity, lower levels of autonomy, poor prospects and widening earnings inequality.<sup>6</sup> By far the majority of new jobs have been created in under-valued or low-value services, or in the insecure 'gig' economy<sup>7</sup> whereas vacancies for a small albeit growing number of high-quality, high-skilled, high-tech jobs are hard to fill.<sup>8</sup>

Technology is the main driver of these disruptions.<sup>9</sup> Technology – if responsibly designed and deployed – has vast potential to create new, good jobs and improve work and working lives across the country.<sup>10</sup> But improvements to the nature, conditions and quality of work are not happening automatically. Serving the changing needs of our society therefore demands that we better understand and shape changes to the world of work so that we can maximise its benefits, while protecting against negative impacts.

To do this requires reframing 'automation' in relation to the future of work.

# 1. The transformation of work in the UK

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## Reframing automation

Automation is the buzzword which frames most thinking and public dialogue about the use of technology and the future of work, and it has tended to be associated with the displacement of humans from particular tasks or jobs or the creation of new ones.

Automation at work has far more expansive consequences for the future of work than previously envisioned. Beyond displacement and creation, automation describes the integration of technologies for a range of uses in the workplace including the design, management and organisation of jobs and businesses. These are reshaping the nature and experience of work, and the structure of the economy that provides it. In this context, we have seen new forms of automation emerge through the pandemic.

For example, the pandemic has accelerated the extent to which some roles can now be mediated remotely, through ‘telepresence’. Automation has also enabled the ‘transference’ of work from workers to consumers, for instance replacing performance management by people, to customer ratings alone. New technologies can ‘augment’ human skills and performance by providing personalised guidance and training, while digital management and oversight of work has increased predictive scheduling of tasks and activities, which can ‘intensify’ work.<sup>11</sup>

The Review will adopt an inclusive definition of ‘automation technologies’. ‘Technology’ here includes digital technologies, artificial intelligence and machine learning, robotics, the internet, the internet of things, big data analysis. These technologies may combine and can be applied in diverse ways. They may also require a collection of techniques, skills and knowledge when used by humans.

This reframing of automation and automation technologies is important because it captures access to, and distribution of, work as well as changes to its content, conditions and quality. These transformations are likely to be more profound and long lasting than the substitution of human work by machines.

# 2. Trends in automation and work

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## Before the pandemic, there was growing consensus about broad trends in automation and work.

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Some research had indicated the sectors most likely to grow or contract;<sup>12</sup> the most valuable and least automatable skills we possess;<sup>13</sup> and the groups of people most likely to be adversely and disproportionately affected by technological transitions.<sup>14</sup>

Most assessments, depending on definitions, thresholds and time horizons, settled on an aggregate figure of between 10 and 30% of existing jobs having significant potential for ‘automation’.<sup>15</sup> It is likely that the communities most affected by automation will already be vulnerable by other measures – relative poverty, lower life expectancies and lower average levels of educational attainment among other characteristics – and therefore disproportionately experience adverse impacts.

While these past assessments of the likely impact of automation are important milestones, they do not consider the wider potential impacts of automation on work. For example, since they are aggregate and focus on technical capabilities, they do not reveal actual impacts and experience at a local level. Currently, there are no nationwide statistics on technology adoption available, and there is very little data on how automation technologies are changing access to, and the nature and conditions of, work across the UK. Moreover, COVID-19 has introduced new factors and accelerated certain aspects of automation which must be factored in.

**There are five key trends relating to automation and work most relevant to the Pissarides Review:**

- (i) Innovation is not leading to improvements in job quality.
- (ii) The adoption of automation is uneven across the UK.
- (iii) Labour market inequalities are growing.
- (iv) Work is key to health outcomes.
- (v) Place increasingly defines our experience of work.

(i)

## Innovation is not leading to improvements in job quality



**“Technology innovators rarely consider impacts on work, which reduces the likelihood that its benefits spread to working people. Innovation should be directed to create better jobs.”**

Professor Sir Christopher Pissarides

The UK is internationally recognised for its leadership in research, the excellence of its scientific institutions and attractive start-up scene, particularly in AI.<sup>16</sup> However, while the pandemic has spurred increased adoption of automation technologies, the rate of innovation in the UK has slowed over recent decades,<sup>17</sup> and high-tech exports and services are falling. The distribution of research, development and innovation (RDI) activities is also not evenly spread, but concentrated around the UK’s around major cities and the Greater South East.<sup>18</sup>

While there is much work underway on AI ethics and responsible innovation,<sup>19</sup> early evidence suggests that innovators under-consider the impacts of technology at work, and that greater focus is needed on both societal impact and human complementarity in the development of automation technologies.<sup>20</sup> Research from the Institute for the Future of Work has also highlighted experimentation with data-driven technologies in many work places without an informed sense of returns or an evaluation of the trade-offs of impacts on work and people.<sup>21</sup>

Securing economic and social benefits, while supporting the UK’s strong research and innovation base, demands further effort to design and deploy automation technologies in ways directed at improving the experience of work and quality of jobs, as well as productivity and levels of employment.

To achieve this outcome and maximise the benefits of technological innovation for as many people as possible, the UK will need to combine its strengths in championing good work and governance with those in science and innovation.<sup>22</sup>

(ii)

## The adoption of automation is uneven across the UK



**“The newer and more uncertain the technology, the more difficult it becomes to rely on traditional investment decision tools and the more important become the innovation capabilities of organisations and the adaptability of the workforce.”**

Professor James Hayton

The beneficiaries of technology, and ultimately its consequences for work and workers, are contingent on why and how technology is adopted. If implemented responsibly, with appreciation of the impacts on work and people, automation technologies have the potential to create better jobs, working conditions and work quality. If not, the reverse can happen.<sup>23</sup>

The adoption of automation technologies is influenced by numerous factors including size, scale and resources of firms; incentives and demands; perceived risks and returns; workforce skill, supply and adaptability; investment and access to finance; regulation; and workplace and social attitudes. Recent shocks are likely to have implications for each of these factors, which are context dependent.

Large, well-resourced companies are more active in adopting automation technologies – a trend that is likely to become more pronounced in the near future. Although demand for certain kinds of work may be reduced, the evidence points to more profound impacts on the nature and quality of work and business models over reductions in staff.<sup>24</sup> Early evidence suggests that higher levels of knowledge-sharing, collaboration and active stakeholder engagement, tend to lead to better outcomes for people and firms.<sup>25</sup>

Small and medium-sized enterprises (SMEs) lack access to scale economies and tend to be more risk averse but, where they do adopt automation technologies, they tend to be more reliant on the capacity of their workforce to adapt and combine with training programmes. Where this is achieved, technology adoption is associated with better outcomes for people and firms. At the same time, investments in training programmes by large employers have reduced as the economy has contracted.<sup>26</sup> A lack of investments in training may undermine the successful adoption of new process technologies and the possibility that the workforce can experience better outcomes.<sup>27</sup>

The scope and pace of automation technology adoption is accelerating in many areas and has notably increased through the pandemic in response to changing demands and incentives, for instance to manage work remotely with machine- and data-based control and monitoring and enhance ‘on the ground’ visibility.<sup>28</sup> However, technology adoption is concentrated by geography as a result of clustering and regional knowledge spillovers, and is not consistent across firms, sectors, occupation or place.

(ii)

## The adoption of automation is uneven across the UK

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The pervasiveness of adoption has been driven further by an explosion in data collection through the pandemic, capabilities which extend to complex critical and analytic functions including behavioural nudging and prediction,<sup>29</sup> and the fusion of new technologies and platforms applied in new ways in response to new challenges.<sup>30</sup> But in spite of the upward trend of automation technology adoption, overall technology diffusion in the UK remains low and inconsistent by OECD standards<sup>31</sup> which contributes to the UK's productivity gap<sup>32</sup> with its own consequences for inequality.

To date, evidence suggests that the returns of technology adoption are being less evenly distributed and shared with workers, compared to previous technological transformations.<sup>33</sup> In particular, while the more highly skilled workers may find their roles enhanced, 'low' skilled workers become particularly vulnerable.

Capital-intensive technologies tend to be more concentrated in particular geographic areas and less integrated into local economies. To date, there appears to be less 'trickle down' of the benefits and opportunities of technology than in past industrial revolutions, partly because automation technologies tend to be more concentrated in particular geographic areas as we discuss below. Compared with earlier technological transitions, the potential for substantial reorganisation of work and business models is greatest for data-driven and AI-based automation, which points to increased potential for widespread disruption of work and the work force. This disruption will not be experienced evenly around the UK, as the next section explains.

(iii)

## Labour market inequalities are growing



“The pandemic has shone a light on traditional inequalities at work, as well as on new and emerging axes of inequality such as the ability to work from home without social contact.”

Anna Thomas, Director  
Institute for the Future of Work

History tells us that both the beneficial and adverse consequences of automation are not evenly spread. Technological transitions have ‘winners’ and ‘losers’ and there will be painful adjustments as people transition between jobs, occupations and sectors. Although some studies have predicted a reduction in labour market polarisation as a result of automation,<sup>34</sup> current evidence points to ongoing polarisation between high-skill, high-pay and low-skill, low-pay jobs.

Labour market polarisation is associated most closely with economic inequality but can be linked to a range of other inequalities in access, conditions and type of work. The Institute for the Future of Work, for example, has revealed enormous variation between people and places, and even neighbouring areas, and their access to many domains of good quality work.<sup>35</sup> The Deaton Review has also confirmed substantive and growing labour market inequalities in the UK.<sup>36</sup> These in turn affect, and are affected by, traditional dimensions of inequality such as gender, age, race and geography. Across the literature, there are three main theoretical mechanisms have been developed to articulate technological transition and the relationship to polarisation:

### 1. Skills-biased technological change

In which greater rewards are given to those who are complemented by technology, although it is now widely recognised that industry concentration and the emergence of superstar firms play a significant role in reallocating rewards.<sup>37</sup>

### 2. Routine-biased technological change<sup>38</sup>

This focuses on the capability of contemporary automation technologies to displace tasks which mainly characterise jobs in the middle of the labour market, reducing demand for those who were in middle pay roles. Meanwhile, a growing number of workers are forced to compete for jobs at the ‘bottom’ of the labour market, exacerbating downward pressure on wages.<sup>39</sup>

### 3. Capital-biased technological change

Seeks to unpack the specific role played by technology in the reduction of labours’ ‘share’ from work, relative to capital.<sup>40</sup>

Each approach has strengths – and each needs review following the pandemic.<sup>41</sup> At a structural level, automation technologies, practices and models of work have enabled an increase in outsourcing, agency and alternative work arrangements.<sup>42</sup> This is further contributing to a highly unequal distribution of earnings and opportunity through work by both national and international standards.<sup>43</sup>

(iv)

## Work is key to health outcomes



**“Inequalities in access to good work are closely associated with a range of health indicators, including life expectancy, diseases of despair and resilience to COVID-19 mortality. Good work is key to good health.”**

Professor Jolene Skordis

Good work correlates with a wide range of health measures including life expectancy, life satisfaction, mental health, disease and deaths of despair.<sup>44</sup> Good work not only provides a good standard of living, but a sense of dignity and autonomy, the opportunity to grow and flourish, along with social networks and support. We have known since the Black Report, that while absolute poverty affects health outcomes, so too does relative poverty – even if basic needs for food, shelter and warmth are met.<sup>45</sup> Therefore, if good work is unequally available to communities through labour market transitions, relative poverty and its health consequences will follow.

The Institute for the Future of Work’s Good Work Monitor finds that regions of the UK in which good work is most available have fared best through the pandemic, with less exposure to COVID-19 and reduced impacts on health, including COVID-19 mortality. Bad work can do the opposite, locking people into working poverty and reducing their sense of security, purpose and control. The Good Work Monitor highlights that there is a negative correlation between the availability of good work, and the prevalence of diseases such as chronic liver diseases, drug use disorders and self-harm across regions, a trend that has also been recognised in the United States.

Preliminary analysis shows the extent of variation in the burden of disease caused by these conditions in local authorities across England and strong associations with socioeconomic conditions, including those related to work. Interestingly, the role played by different conditions within the diseases of despair varies hugely across the country and may point towards differing challenges and solutions to this growing problem. Research on the direct impacts of new technologies on workplace health highlight the importance of how it is implemented, organisational norms around its use, and employee perceptions of its effect on their role.<sup>46</sup>

It is anticipated that there will be growing inequalities in exposure to the adjustment costs of automation, observed through work and health inequalities. There is very little data, and even less modelling, on the unequal distribution of impacts associated with automation.

(v)

## Place increasingly defines our experience of work



**“We urgently need to deploy new methods alongside traditional ones to deepen our understanding of the impacts of labour market transitions and their distribution across the country.”**

Professor Mauricio Barahona

Compared to OECD peers, the UK is known for stubborn geographic inequalities<sup>47</sup> across the country.<sup>48</sup> In terms of labour productivity, London and a handful of nearby areas are well ahead, with the most productive cities in the North-West and North-East almost a third less productive than London. These differences are closely linked to how decades of structural transformation have shaped the make-up of the economy and the sectoral composition of employment in local labour markets. This has significant implications for the occupational and skills composition of the workforce in each place. The concentration of the demand for high-skilled jobs and supply of high-skilled workers may reinforce each other in driving increasingly large spatial disparities in wages and employment.<sup>49</sup>

Beyond wages, many other factors underpin the availability of good jobs and opportunities for career progression, such as labour market operations and norms and infrastructure are local in nature. The Good Work Monitor shines the spotlight into the nature and extent of regional disparities in access to good work across local labour markets in time and place.<sup>50</sup>

On top of this, several factors invite a new emphasis on place and the geography of work to understand and respond to contemporary automation. Technological adoption is concentrated in geographic hubs with adoption accelerated unevenly across communities, especially during times of economic decline. Many supply chains have been hollowed out and are being rebalanced out of necessity or to reduce risk and dependencies in the future. Capital-intensive automation technologies, which are not designed at home or in response to local challenges are less likely to be well integrated into local economies. Against this background, we have seen that place-based vulnerabilities to economic shocks and the adverse impacts of technological transition have been exposed, or exacerbated, through the pandemic.

Overall, our evidence review demonstrates the need for an updated and more granular understanding of contemporary automation. This will enable a tailored response by place, which will help ensure regional disparities on the impact of automation do not widen further.

# 3. Our multi-disciplinary approach

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**A deeper and more granular understanding of the impacts of contemporary automation on work and wellbeing must rest on a strong theoretical foundation.**

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Framing this Review is Pissarides' theory of labour market frictions. Building on this seminal work, we have designed a new, multi-disciplinary approach to understanding how and why workers are exposed to 'frictions' associated with technological disruption.

Frictions are manifested along three dimensions:

**1. Skills friction**

Caused when skills requirements rapidly change as a result of the introduction of automation technologies.

**2. Information friction**

Resulting from uncertainty about who will be affected and how.

**3. Geographic friction**

As local jobs are shed, and new work is located elsewhere.

The theory of frictions has not been applied to understand the impacts of unevenly distributed adjustment costs on employment, wellbeing or health outcomes for workers by spatial or demographic communities. We hypothesise that the extent of each friction will be unequally distributed between demographic groups and regions.

Complimenting the theory of frictions, the Review will deepen our examination of the impacts and implications of adjustment through the lens of capabilities. This approach focuses on the conditions that enable every person, whatever their background, to have the ability to find work in which he or she can fulfil their capabilities. Higher capabilities should support transitions to new or better jobs and may insulate some workers from the negative impacts of automation. Poorly managed transformations may reduce workers' capabilities to adjust to the new world of work and impact their wider wellbeing.

### 3. Our multi-disciplinary approach

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Our overarching question is: how can we shape technological transitions to build a better future of work in the UK?

Key activities of the Review will include:

- The first national Disruption Index to map and track technological disruption across the UK.
- A firm-level survey to explore the motives, barriers and effects of introducing automation technologies.
- A deep dive into work challenges and opportunities into eight locations in England, Wales and Scotland.

There is an emerging consensus that changes to work, driven primarily by technology, are pivotal to understanding divisions and inequalities across the country, seen sharply through growing labour market inequalities. Unlike no time before, there is new interest in academia and politics in the creation of good quality jobs through transition, as key to shaping a more resilient and fairer Britain. But, in order to achieve this, there must be a better understanding of technological transformation, its distribution across the UK and the impacts for work and workers.

Over the next three years, the leading interdisciplinary team of academics and policy experts, led by Professor Sir Christopher Pissarides, will work together to provide this understanding, inform our policy responses and improve outcomes for workers and communities across the country.

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**If you have a professional or research interest in the subject of the impact of automation on work and wellbeing and have insights to share, we would be delighted to hear from you.**

**For more information on the Review, visit [pissaridesreview.ifow.org](http://pissaridesreview.ifow.org).**

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**The Pissarides Review**  
into the Future of  
Work and Wellbeing

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Automation technologies are transforming work, society and the economy in the UK in ways comparable to the Industrial Revolution. The adoption of these technologies has accelerated through the COVID-19 pandemic, and the impact of automation is unevenly distributed, with a disproportionate impact on demographic groups in lower pay jobs.

The Pissarides Review into the Future of Work and Wellbeing will research the impacts of automation on work and wellbeing, and analyse how these are differently distributed between socio-demographic groups and geographical communities in the UK.

For more information on the Review, visit [pissaridesreview.ifow.org](http://pissaridesreview.ifow.org)

If you have a professional or research interest in the subject of the impact of automation technologies on work and wellbeing and have insights to share, please contact Dora Meredith, Head of Programmes at the Institute for the Future of Work at [dora@ifow.org](mailto:dora@ifow.org)

If you are a member of the press and have an enquiry or would like to receive new press releases by email, please email Hannah Kitcher, Communications Lead at the Institute for the Future of Work at [hannah@ifow.org](mailto:hannah@ifow.org)