



Institute *for the*
Future of Work

Future of Work Commission evidence review

The impact of automation on labour markets: Interactions with Covid-19



Putting people first

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Introduction

Covid-19 has struck societies and the economy amid of one of the greatest technological transformations since industrialisation, often captured under the banner of the ‘fourth industrial revolution.’ The global pandemic is likely to accelerate the application of new technologies, in particular data-driven technologies, by introducing new demands and targets for research. The new technological revolution, overlaid by the shock of Covid-19, could transform work and labour markets in ways and at a pace which may well be unprecedented.¹ The social and political response to these combined challenges will shape the future of work for generations.²

This paper explores possible interactions between Covid-19 and labour market trends attributed to the disruption of new technology. It updates a literature review originally prepared by Joshua Simons for the Parliamentary Future of Work Commission, and was in this instance prepared to inform an Covid-19 emergency reconvene of the panel of experts who originally informed the Commission. The report from this session, and its recommendations, can be found on our website.

It is important to note that in this piece, we do not consider impacts on the lived experience of work, such as changes in the application of surveillance technology in the workplace, or moral and philosophical questions about the nature and or purpose of work.

Pre-Covid-19: what do we know about ‘automation’?

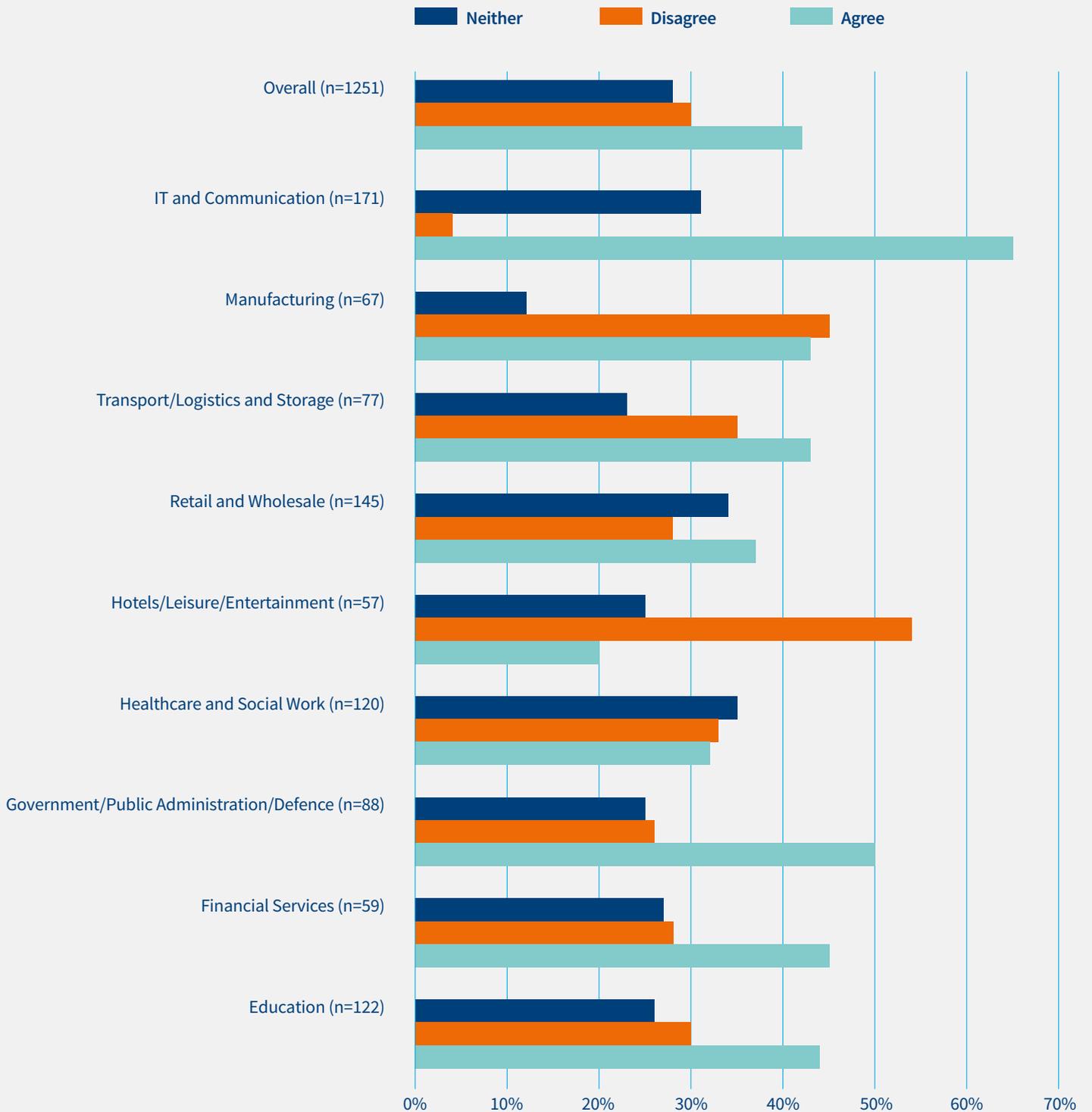
The Institute for the Future of Work (‘IFOW’) has argued that ‘automation’ should be redefined to cover task creation, augmentation and impacts of the experience of work and job quality, as well as the displacement of tasks and jobs. As automation is a process which is guided by human decisions, rather than a force which works autonomously, our exploration of it should also extend to the role of human designers and decision-makers: why and how automation happens in a particular context, not just how much automation happens.

Pre-Covid-19 projections of the impact of automation on the labour market vary. A 2018 report projected that 30% of UK jobs are at risk of automation.³ The ONS projected 7.4% in a 2019 analysis.⁴ The OECD predict an average of around 14% for OECD nations.⁵ Others suggest that the plausibility of mass technological unemployment – or ‘a world without work’⁶ – may be regaining momentum. IFOW has estimated that between 15–30% of current jobs will be lost within the next decade.⁷

Differences between these projections mostly reflect different definitions and assumptions about what is ‘automatable’, different understandings of the capacity of existing technology, and the time horizon taken into account.⁸ Moreover, the literature on the replacement of labour by robots and AI has tended to focus on the potential application of the capabilities of new technologies, which can be difficult to predict.⁹ Authors of a leading economic theory¹⁰ of the impact of technology on labour markets excluded ‘placing orders’ from their categorisations of work likely to be automated. Shortly thereafter, it became commonplace to order a meal via an app – possible even before arrival. Advances in digitisation and artificial intelligence mean that machines can now draft contracts, predict behaviour, use psychometrics to enable the advanced surveillance of workers, and contact trace down to a few centimetres.¹¹

IFOW has previously described¹² a ‘growing consensus’ that current economic trends are in many ways driven by technological innovation,¹³ and that in addition to sectoral differences, some communities are disproportionately at risk by these changes. This assessment, and projections of the impacts of automation, which have significant implications for the future of work, democracy¹⁴ and equality¹⁵ must now be re-examined.

**Figure 1: To what extent do you agree with the following statement:
Over the past year my employer has introduced digital technology that has changed the way I do my job**



NB: Sectoral data is unweighted. Not all sectors are included in the sectoral data, due to low sample sizes (n<50).
Data from a poll conducted by IFOW and Opinium. Fieldwork 22–26 May 2020.

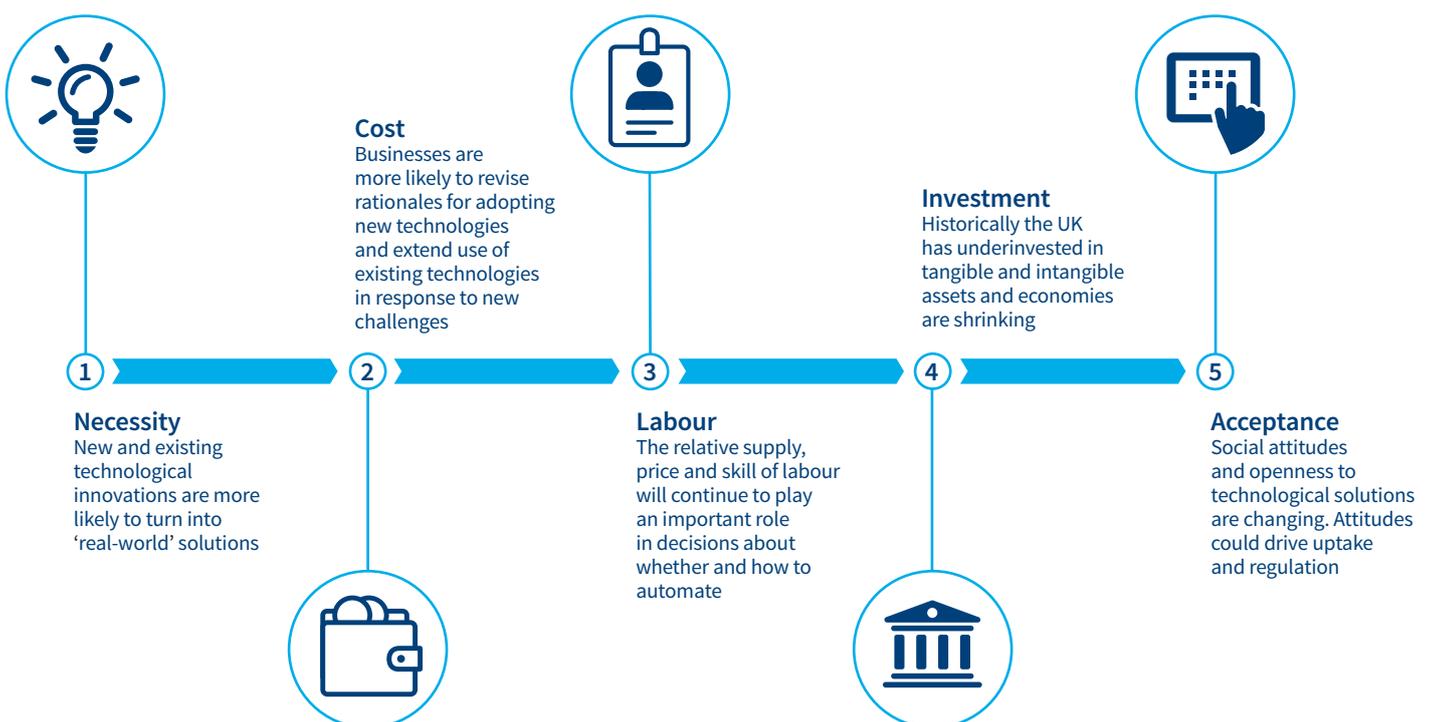
How might Covid-19 accelerate automation?

Figure 2 presents some of the factors which impact pace and uptake of technology. As we present evidence for in this paper, Covid-19 increasingly ‘necessitates’ some tasks being mediated through data-driven technologies, as well as augmenting tasks to be completed remotely; it is changing rationales for investment in technology; it is rapidly impacting the supply of labour – both increasing aggregate unemployment and restricting feasibility of labour being present at some workplaces; and it is changing public attitudes¹⁶ towards the uptake of new technologies. Deloitte (2015 p. 6) suggested five years ago

‘For service occupations, it may well be that the demand for labour... cannot be met by what is currently immature and inexpensive technology. It could also be that recipients of such services prefer to be served by humans rather than robots’¹⁷

The second of these barriers has clearly changed under current conditions – with human contact a declining preference, and in some cases proving a source of significant psychological strain. Separate surveys of CEOs and workers in July 2020 suggest that greater levels of automation are anticipated as businesses adjust, not least to economic pressures arising from Covid-19.

Figure 2: The extent, nature and pace of technology adoption



How might Covid-19 accelerate automation?

In practice, the entire 'cycle' of automation – from design of technology, decisions about its use, displacement of some tasks, augmentation and creation of others – are shaped by Covid-19, which crafts new targets for technologists, new requirements to reduce human contact, new demands for remote and on-line services, a new sense of value for certain types of work, and new implementation of technologies for remote work.

Covid-19, by placing restrictions on freedom of movement and human contact, creates an obvious and immediate driver of remote working. This could shape the probability and nature of automation: flexibility of the task vis-à-vis location. Sustainable work – work which will endure through the pandemic – often needs some degree of flexibility in the location requirements of the job.

However, the technology-related impacts of this economic shock are likely to go much deeper and create more systemic change than remote working. Our review suggests there will be enduring transformation at systems and firm, as well as individual, levels.

At a systems level, economies are shrinking and suppressing supply and demand that depends on close human contact.¹⁸ Further, recessions may be deeper during periods of technological transition.¹⁹ A turn away from globalisation and growth in re-shoring or near-shoring as a result of Covid-19 was quickly prophesied,²⁰ and has to some extent been announced as part of the UK economic development response, with the Prime Minister announcing he wants to move towards self-sufficiency in various sectors and put an end to Chinese imports,²¹ which have been shown to negatively affect employment and wages of UK workers. But re-shoring is not straightforward and can cause domestic inflation and mismatches of skills to jobs.

Perspectives remain split on the length and depth of any Covid-19 induced recession,²² but research has shown that cities most impacted by the 2008 recession underwent higher rates of technological transformation,²³ and that cities or regions which are hubs for technological employment tend to concentrate their share of these jobs nationally during recessions, deepening regional divides.²⁴ This is also reflected in geographically uneven uptake of technology, with evidence suggesting technologies begin by being concentrated in hubs and then diffuse across space. Moreover, research suggests that automation happens in bursts and can concentrate during economic shocks, especially for those in automatable occupations.²⁵

How might Covid-19 accelerate automation?

Forthcoming work by IFOW research fellows suggests companies reduce spending on worker training after big economic shocks. This has the potential to change incentives to automate, as human potential is not developed or recognised.

At a firm level, some sectors have been closed with extreme restrictions to re-opening, while others have transformed to on-line models, sometimes within days or weeks. Affecting individual experience, this is ushering in an expansion of data-driven technologies in the workplace, both for Covid-19 contact tracing²⁶ and for general remote management.²⁷ This sparks increased concerns regarding privacy and individual autonomy presenting ever greater risk of 'surveillance creep' – whereby surveillance developed for a limited purpose, such as fighting a pandemic or filming traffic violations, becomes used in ever more pervasive and permanent ways.²⁸

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Current ‘automation’ – understanding the technology and adoption

The period of technological change we are currently living through is largely defined by digitisation and computing, artificial intelligence (AI), and robotics. The connectedness of these technologies means most developments are developments in *information* technology (‘IT’).²⁹ This is changing the distribution of and control over information in a data-driven society, raising questions about who owns it, who controls its use, and who can access its benefits which must be addressed as use becomes increasingly pervasive.³⁰

Key to this particular revolution has been ‘Moore’s Law’ – predicting that engineering advances would reliably increase processing power of computers twofold each year, while simultaneously reducing the cost. Such exponential growth in capability – and its affordability – generated projections that by 2050 a single desktop could ‘exceed the processing power of all human brains on earth’.³¹

Such omnipotence is sometimes described as ‘General Artificial Intelligence’. However, while Moore’s Law has remained true it is reaching its limit³² and is predicted to flatten by 2025.³³ In contrast, narrow AI – highly capable of solving specific and discrete problems, with clear applications – is proliferating, designed for commercial contexts³⁴ and is in turn transforming economies and work.³⁵ This owes in part to developments in Machine Learning (ML): a ‘statistical process that starts with a body of data and tries to derive a rule or procedure that explains the

data or can predict future data’.³⁶ A subset of ML is ‘Deep Learning’ (DL). This uses a number of layers, modelled like neurons, which makes it possible to recognise very complicated patterns in data. Without representing ‘general’ intelligence, this equates to what could fairly be described as relentless, rapid and almost ‘alien’³⁷ analytical capability. Nevertheless, many remain sceptical about the ability of ML to resolve ‘real world’ problems, especially where there is a sudden change in human behaviour.³⁸

The degree of truth in this accusation in part determines the extent to which ML could be ‘labour replacing’ rather than ‘labour augmenting’. Such cognitive technologies are transforming wholesale business processes. HANA – a machine learning powered database – allows multinational behemoths like Walmart to monitor almost all aspects of their business – including staff – in real time.³⁹ These kinds of AI platforms control logistical processes augmenting people and goods at a scale that spans continents. While they seem ethereal, their relationship with the material is significant, restructuring and remaking lived reality rather than simply presenting stories about it.

The ‘Internet of Things’ (IoT) could eventually mean that much of the data which currently has to be curated by humans to feed cognitive systems will become automatically extracted by technology from the environment.

“

Workers expect greater levels of automation in their workplace as businesses adjust, not least to economic pressures arising from Covid-19.

What does this mean for jobs?

Changes in technology have repeatedly transformed the labour market – who does what, where, and for what. How exactly this happens changes over time, partly owing to the intrinsic qualities of new technologies but also to the cultural and political conditions within which technology develops. In turn, technological change shapes politics, as IFOW highlighted in our report prior to the 2019 General Election.⁴⁰

As new inventions or discoveries change the tasks workers are required to complete, the labour market is restructured and workers who are likely to lose out seek political influence to slow or divert technological change. Such transformations in the 1700s led on the one hand to laws which punished by death the destruction of machinery,⁴¹ and on the other contributed to the creation of the earliest forms of social welfare, with the Poor Laws⁴².

History teaches us that the question of who technology benefits, and ultimately its consequences for the labour market, is contingent both on the nature of the technology, how it is adopted, and political responses. To separate the mechanism by which technology causes changes to work from the consequences of those changes, we need to separate how technology could change labour markets from the impact those changes end up having. Three theories have been proposed for how technology impacts on the labour market. Since many recent changes have been driven by the interaction between technology and Covid-19, these mechanisms remain helpful in understanding labour market trends.

What does this mean for jobs?

Skills biased technological change

This argument suggests that technological change is ‘biased’ towards higher skills, demanding more educated labour, and leading markets to reward them for that education. This has been described as ‘technology-skill complementarity’, or ‘Skills Biased Technological Change’ (SBTC). In this scenario, new technology would result in an increase in the income differential between relative skill groups. This model explains the increase in the average of postgraduate and undergraduate wage differentials since the 1980s, as the broad spread of information technology coincided with a lag in the supply of educated, high-skill workers.

Returns to education in the UK have been estimated to be among the highest in the major European Union countries,⁴³ as has been demonstrated using a range of methodologies. It has been estimated that the use of a computer is associated with an average increase in wages of 8% to 15%, though there is some doubt about the accuracy of those estimates and the causality of the ‘computer-effect’.⁴⁴ Some have argued persuasively, for instance, that the use of broadband has a positive (and likely, causal) effect on the wages of skilled workers.⁴⁵

Covid-19 has cast new light on these differences, as research⁴⁶ finds a direct correlation between ability to work from home – enabled through computer based, teleworking – and income. As mentioned earlier, research shows that on average, those earning less than £20k can only do 30% tasks from home, versus 58% if earning more than £50k. The Oxford Internet Institute finds that highly skilled IT freelancers are in high demand throughout the crisis, described as ‘pandemic proof jobs’.⁴⁷

However, there are systemic criticisms of the skills biased technological change theory. First, it is difficult to know that educational premiums are actually the result of skills, of which educational levels are an inadequate measure. It is also difficult to say to what extent education gives you skills. Second, the SBTC model cannot explain the fact that, while there has been growth in high-skilled jobs, so too has there been a growth in the number of low-skilled jobs. It is in fact many mid-skill jobs which have been squeezed.

Recent work which studied the tasks undertaken by innovations which have been patented⁴⁸ suggests that AI – in contrast to other forms of software – is most likely to substitute so-called ‘high’ skill tasks. This could in turn have a significant impact on the professions⁴⁹ and reduce any remaining impact of SBTC. For now, however, our review suggests that technology-skill complementarity has played a more significant role since lockdown.

What does this mean for jobs?

Routine biased technological change

An alternative explanation of how technology might change labour markets is 'Routine Biased Technological Change' (RBTC). This focuses on the way technology shapes tasks, as the mechanism by which it changes labour markets. RBTC suggests that growth of high skill jobs, rather than being the result of technology demanding higher skills (SBTC) owes to the fact that technology can automate a lot of routine activity. In turn, non-routine tasks, requiring intellectual dexterity and creativity, increase their relative share of employment.

The insight of this approach is that it focuses on tasks rather than jobs. Computers are unlikely to replace all tasks within a 'job' – which typically demands a range of tasks. But they may change the distribution of tasks across jobs if computers can automate a large part of work. There is a wealth of evidence that at least until now, automation has broadly taken place in jobs that involve a high prevalence of routine tasks, which follow specifiable rule-based procedures.⁵⁰ For instance, the share of employment for machine operators and assemblers, whose jobs have a high routineness score declined by 50% from 1993 to 2015–16.⁵¹

The predictive capacity of this theory, however, depends on first the premise that technology can only complete routine tasks, and second that tasks can effectively be identified as routine. As stated earlier, second wave AI tools, or machine learning systems, are now able to undertake reasoning without being programmed, deriving new rules. Effectively this means that tasks which are seen as requiring tacit knowledge – knowledge which can't be communicated or topologised to be applied routinely – are now being delivered by machines.⁵²

Adherents to RBTC still believe direct displacement and replacement by technology is unlikely, as many jobs which have highly routinised components involve other tasks which are difficult to 'unbundle' without a significant drop in quality.⁵³ Most work packages demand a range of inputs from labour – brains and brawn, creativity and repetition, intuition and technical knowledge, following rules and knowing when to break them. The crucial point being that improvements in one task do not negate the need for the others. Ultimately whether AI displaces labour, or creates other effects which counter this, is still a subject of debate.⁵⁴

What does this mean for jobs?

Further, explaining labour market trends at a national level this way could underestimate other contributing factors, such as offshoring of some routine work.⁵⁵ However, at present our best estimates of automation of the UK labour market, via the ONS are based on these assumptions. Identifying routes to good, reliable data on automation is something IFOW have campaigned for and will remain proactively engaged in.⁵⁶

As to RBTC and Covid-19, economists have noted the cyclical nature of automation, reporting that over the three recessions in the last 30 years, 88% of job loss took place in 'routine' automatable professions. An analysis of on-line job postings before and after the Great Recession also found that firms in were replacing workers performing 'routine' tasks. More recently, a McKinsey study in May 2020 found a close correlation between jobs at risk because of Covid-19, and jobs at risk because of displacement of routine jobs.⁵⁷ Our review suggests that the current approach to estimating RBTC needs swift review in the light of the sharp recession already underway.

Capital biased technological change

The third theory put forward by economists to explain how technology changes labour markets is Capital Biased Technological Change (CBTC). In classical economics, capital refers to investments which are not labour – principally equipment and machinery. In this framing then, CBTC refers to a shift from investment in people, to machines.

There is significant evidence that across OECD countries over the last few decades, when you remove the top 1% of earners, labours overarching share of income has declined. In a study of 59 countries, labours share of income was found to decline by around 5% points over the 35 years leading to 2013, which was consistent across industries and regardless of labour market regulation or presence of natural resources.⁵⁸ They attribute this to the relative price of investment goods, often the result of advances in technology and the computer age. These forces are not only shaped at the national scale. Research shows that at a local level the supply of affordable labour can in shape profiles of capital investment within sectors, localised below the national level.⁵⁹

What does this mean for jobs?

Criticisms of the SBTC model complement the CBTC model. Buy-in to SBTC was once so significant some felt it explained the growth in ‘superstar’ income of the top 1%, over and above social norms or changes in managerial power.⁶⁰ This makes sense, perhaps when looking at Amazon founder, Jeff Bezos – an electrical engineering graduate and the world’s first centibillionaire; or Microsoft Co-Founder Bill Gates, who is famed to have taken mathematics and computing, but been so talented that he dropped out early to start the business which made him a millionaire in his mid-twenties. However, it has been more recently demonstrated⁶¹ that such runaway capital gains are the result of ‘superstar’ business models, rather than superstar individual skills – particularly those based around software platforms – which gain significant first mover advantage through ‘network effects’ and continue to grow through market concentration. Amazon, Facebook, Uber are prime examples of this. While great emphasis is placed on data as the source of monopolisation in this regard, fixed capital presents as much of the barriers to entry for new parties.

Despite this it remains unclear whether technology is the overarching cause of labour’s share declining. While returns to capital can be seen in countries where the power of trade unions has not waned, such as Sweden and Finland,⁶² some argue this is the result of the waning power of institutions that represent worker interests.⁶³ Others argue it is privatisation, changing models of ownership and hence compensation.⁶⁴ Most aptly for the above examples, are analyses which suggest that securing positive outcomes for labour from AI depends upon the creation and upholding of appropriate competition policy,⁶⁵ and a wider legal reform to account for the complete transformation of economies under informational capitalism.⁶⁶

Globalisation and imports – mediated through technology – also complicate the story. While it is plausible that the declining labour share is a result of considerable shifts in the global labour supply, following the integration of China and India into the global economy, available estimates suggest that just 10% of the decline of the labour share in OECD countries between 1990 and 2007 can be accounted for by import competition from low-wage countries.⁶⁷

Analyses which suggest that securing positive outcomes for labour from AI depends upon the creation and upholding of appropriate competition policy.

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On average, those earning less than £20k can only do 30% tasks from home, versus 58% if earning more than £50k.

What does this mean for labour markets and the economy in the context of Covid-19?

Each of these three models suggest different ways in which technological change might impact the labour market: by favouring skilled workers, by displacing routine jobs with routine tasks, by depressing the relative price of capital and therefore decreasing labour's share of income.

Each theory has its limitations. However, insights can be gleaned by understanding which of these trends have been salient at which moments and why, in order to make informed judgments about how technology is likely to impact on work in the future and develop appropriate policy responses.

As the Future of Work Commission highlighted, each of these trends will impact sectors of the labour market differently: some will grow, some will shrink, others will move up the skill distribution, and others down it. A sectoral approach is important in assessing the impacts of Covid-19 as some sectors involving high levels of human contact, notably leisure, hospitality and the creative industries, previously identified as growth areas, have been devastated for the short and medium term and are unlikely to return to their current form.

Others, including health and social care, which is essential to tackling the pandemic and whose delivery requires human skills which are hard to automate, will continue to grow, as will technology and telecommunications.

Sectoral impacts overlay with the geography, as despite having a diverse national economy, local economies are often sector biased. The geographically uneven impacts of Covid-19 on employment by locality have already been demonstrated. This makes the need to think about place when designing industrial strategy increasingly pertinent.

Nonetheless, the following broad trends can be identified.

What does this mean for labour markets and the economy in the context of Covid-19?

Polarisation and inequality

Is Covid-19 accelerating the labour market 'gap'?

Labour markets are the result of interactions between productivity gains through technology, and the regulation which determines the distribution of those gains. Technology can, in theory, make anyone better off. However, in recent history the relationship between technological development and labour markets has seen them 'polarising': with a hollowing out of the availability of middle-income jobs and a growth in low-skill and low-pay, and high-skill and high-pay jobs.

On most measures, income inequality rose considerably in the UK in the 1980s, and the share of household income accrued by the top 1% has increased rapidly since then.

A recent study by the LSE⁶⁸ suggests income inequality is today as high as it was just before World War 2. Beyond inequalities with the 1% a new emerging distinction exists with the 0.1%. As discussed earlier in this paper, this has been shown to result from the benefits of technology accruing to a smaller portion of society than high-skilled workers.

There is good evidence that RBTC has removed many intensively routine-based jobs from the UK labour market, and that middle-skill, middle income jobs have an intensive number of routine tasks.⁶⁹ However, routine tasks are not exclusively found in middle-skill middle-income jobs. There is tentative evidence that mid-to high-paying routine jobs may be most vulnerable to automation, from (roughly) the 50th to the 80th hourly wage percentile.⁷⁰ But there is also a significant amount of routine task work in low-paid 'low-skilled' jobs. One view is that low-paying routine jobs are less profitable to automate. This is supported by work which finds that areas with a high supply of low-cost labour, and low land values have tended not to automate (in this case, car washes).⁷¹

Yet, despite the decline in routine jobs, hourly pay distribution has remained relatively constant,⁷² suggesting that other occupations have filled this gap. However, a recent study sheds light on overarching polarisation, despite constant distribution of pay per hour. Laws⁷³ explored declines in hours per worker and found they were far higher in routine, manual jobs. In contrast, there was a lower relative decline in hours per worker in higher skilled jobs – even when they were routine-task heavy. This suggests that patterns in hours per worker exacerbate the impact of employment polarisation on wage inequality.

What does this mean for labour markets and the economy in the context of Covid-19?

The study found that as high-skilled workers increased their fraction of employment and work, medium-skilled workers saw a decline in the share of employment and a decline in hours per worker, and low-skilled workers saw a substantial decrease in hours per worker. Recent analysis of the impact of Covid-19 on labour markets suggests this trend may have deepened further – with high-skill crowd seeing an increase in total employment shares through the crisis.⁷⁴

Both of the above propositions – that low-paying routine jobs may not have been automated because of profitability of automation; and that flexible working has differentiated impacts on high-skill and low-skill parts of the workforce are pertinent in the context of Covid-19.

Firstly, the incentive structures which typically shape business decisions about automation will likely be altered by the pandemic's imminent, forced recognition of the fallibility of labour. A pandemic of this nature has not been present in the minds of executives to feature in resilience planning in the way it will be now. As stated in the introduction, a recent survey of 2,900 executives suggests 36% are already taking steps to automate, and 41% are re-evaluating their plans.

Secondly, flexibility in its various forms has determined the immediate experience of the crisis for workers. A UK survey⁷⁵ found those with the lowest household income were six times less likely to be able to work from home and three times less likely to be able to self-isolate. Knock-on effects mean black and minority ethnic communities are both more likely to die from the virus,⁷⁶ and are experiencing a hunger crisis from financial hardship.⁷⁷ New research finds a direct correlation between income and ability to work from home. On average, those earning less than £20k can only do 30% tasks from home, versus 58% of those earning more than £50k. This presents significant questions for changes in labour markets, both in terms of geographies of remote working domestically, and for potential offshoring.

But it also creates a potentially new forms of polarisation. ONS data reports that men and women working in social care, including care workers and home carers, had significantly higher deaths than those in the same age and sex in the general population. However, rates of Covid-19 deaths in health workers (doctors and nurses) were found to be similar to the general population. The highest rates of deaths involving Covid-19 to date have been seen among 'low skill' workers, with black males and females twice as likely as similar white people to experience a Covid-19 death.

What does this mean for labour markets and the economy in the context of Covid-19?

Job characteristics, and intersectional inequalities have been found to drive other profession specific mortality rates. A recent study⁷⁸ suggests that high mortality among London Bus Drivers was not simply the result of workplace exposure, but also deprivation of their residential area, presence of underlying health conditions, and ethnicity. A study of six countries⁷⁹ found that the young had been consistently economically disadvantaged by Covid-19, and were suffering more psychologically as a consequence. In contrast, the economic impact on different income groups varied by nation, reflecting different policy strategies to shield lower-income groups in the early stages of the pandemic. Such effects could be further compounded by unemployment-induced illness. Labour market inequalities and health inequalities are inextricably linked.

In summary, labour market polarisation is not solely the result of routinised job removal. It is also a product of policy, such as supply-side upskilling of the workforce, female labour market participation, and immigration and welfare reform.⁸⁰ Most agree that the trend towards polarisation will not endure, particularly where there is investment in human capital and education. Covid-19 could however accelerate these trends and demands that more immediate attention is paid to these forces.

Workers in transition

Is Covid-19 accelerating worker transitions?

Technological unemployment is a contested concept. While it has been a common feature of political economic theorising – with Keynes famously projecting the necessity of a 15 hour working week by 2030 – mass unemployment has yet to materialise, despite persistent technological innovation. However, as discussed in the introduction, the nature of Covid-19 and the recession which will follow it, will interact with technological labour market trends. New ONS statistics on vacancy data and our review suggests we are about to enter a second phase of redundancies and that the recession is likely to be characterised by high and persistent levels of unemployment.

LSE⁸¹ research finds that 80% of businesses saw reduced business volumes in June relative to before the pandemic, with 60% expecting to further reduce employment in the coming months. Prior to Covid-19, the UK employment rate has remained high, even when increases in the female state pension age are accounted for.

What does this mean for labour markets and the economy in the context of Covid-19?

Andy Haldane, Chief Economist at the Bank of England suggests:⁸²

'Viewed over the sweep of history, then, there is essentially no evidence to suggest technology has damaged jobs and plenty to suggest it has boosted wages. Technology has enriched labour, not immiserated it... Labour is not dead wood to be carved up between tasks. It is a tree whose trunk and branches have lengthened and thickened with time.'

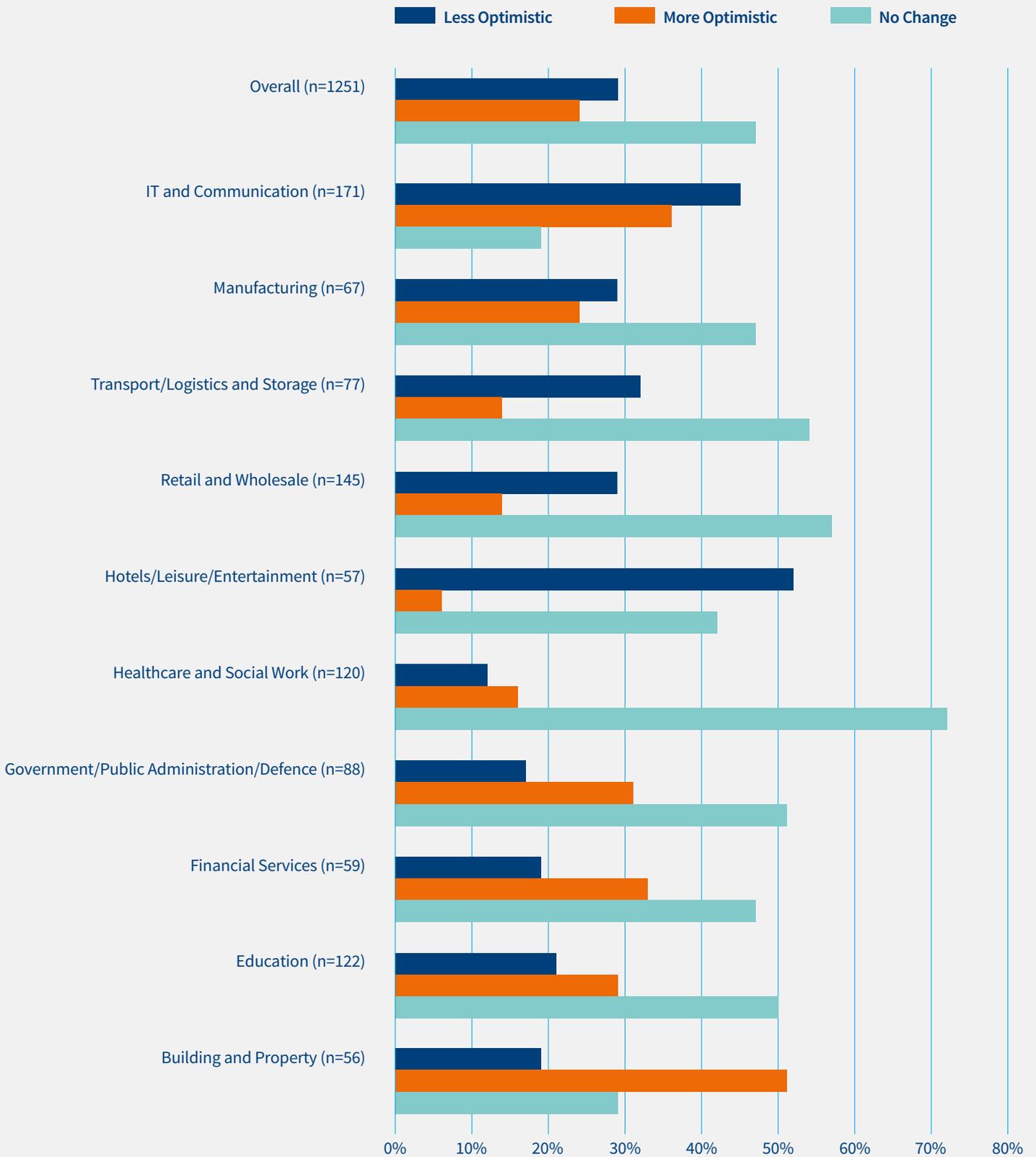
This noted, the pandemic contributed to a growing imbalance between labour supply and labour demand, with ONS reporting that total vacancies dropped by 42% during lockdown. As propensity for community transmission is higher in areas of deprivation, subsequent localised lockdowns could further entrench spatial inequalities in the availability of work and change conditions for technology to be an 'enrichment' to labour.

Absolute levels of employment and average real wages are an incomplete picture. As we have seen above there is now significant evidence of hours of work polarisation in the UK, exacerbating pay and skill polarisation. On average, someone on a zero-hour contract works 25.2 hours per week and are three times more likely to want more hours than workers in more stable employment.⁸³

Some have suggested⁸⁴ that the transition to a services-based economy has contributed to downward pressure on pay, as services are labour-intensive competitive business models necessitating 'under-employment' to gain advantage. These models are also often linked to the growth of contested 'self-employment'. IFOW research suggests these trends, often enabled through platform business models, are escaping the conventional 'gig' economy, and can be found across the economy. These factors interplay with levels of unemployment and labour supply.

While the unemployment rate in January 2020 was reported at 3.8% – a 45 year low – this does not account for those few who are incorrectly categorised as economically inactive, no longer looking for work due to a lack of appropriate opportunities, or those who are 'barely employed' with inadequate hours, which some have estimated⁸⁵ to be around 6% of the labour market. ONS figures suggest the share of the workforce on a zero hour contract increased from 0.5% in 2008 to 3% by 2019, highlighting the way wider economic conditions shape propensity to growth in this employment type. In this context, the relationship to technological change to under-employment is perhaps more significant and worthy of policy attention than technological unemployment.

Figure 3: Do you feel more or less optimistic about your career prospects in your industry than you did a year ago?



NB: Sectoral data is unweighted. Not all sectors are included in the sectoral data, due to low sample sizes (n<50). Data from a poll conducted by IFOW and Opinium. Fieldwork 22–26 May 2020.

What does this mean for labour markets and the economy in the context of Covid-19?

It is also those who experience under-employment – such as carers, retail workers, delivery operators – who have been deemed key and worthy of ‘reevaluation’ in the light of Covid-19.

In addition to the finding above that business leaders are already using automation to adjust to the pressures of Covid-19, is evidence of significant unemployment, reaching up to 11% in some authorities.⁸⁶ This supply of labour could exacerbate trends towards malemployment described above as competition suppresses wages.

As governments seek to rebuild work and the conditions for functioning labour markets in the wake of Covid-19, dialogue about what a fair and sustainable future of work looks like, and support for workers in transition, is increasingly necessary.

Technology can play a key part in productivity by securing more output with less labour. However, whether these gains are returned to labour, and at what distribution, depends on other factors.

Productivity and labour’s share

Does Covid-19 present new imperatives to share rewards?

Productivity refers to the amount of output you get for a given amount of input. It is typically calculated for the economy as a whole, viewed as a ratio of Gross Domestic Product (GDP) to hours worked. Technology can play a key part in productivity by securing more output with less labour. However, whether these gains are returned to labour, and at what distribution, depends on other factors.

Earlier we discussed CBTC. Currently, the share of income going to capital is at levels not seen since the end of the nineteenth century, a period of international capitalism and economic liberalisation not dissimilar to now, in which eye-watering inequality only began to decline with the onset of the First World War.⁸⁷ Some hypothesise this is the result of incomes at the very top rising very rapidly, and as income accrues as capital over time, wage earners become capital owners.⁸⁸

What does this mean for labour markets and the economy in the context of Covid-19?

Capital's rising share of income is in part a consequence of the uncoupling of wages and productivity. When real wages stagnate but productivity rises, we would expect capital to receive an increasing share of national income. As Haldane (2015) puts it,

'since the crisis real wages have fallen faster even than UK productivity, which itself has been extra-ordinarily weak having flat-lined for the past six years. Put differently, labor's share of the national income pie has fallen since 2009, from around 58% to 52%.'

He notes that if UK real wages had kept pace with productivity growth since 1990, the median worker would be 20% better off today.

One theory is that technology is substituting for labour faster than wages can catch up, with firms taking time to accrue the productivity gains from innovations in information technology. Sectors which have been 'technologically stagnant' such as construction, healthcare and social work have seen the largest declines in their real wages, despite being growth sectors for employment. While Covid-19 looks certain to accelerate the adoption of technologies in the latter, with political commitments to advances in health and social care, there is no guarantee that productivity gains will translate to wage growth.

As for CBTC and Covid-19, early indicators suggest that there has been increased concentration of the market power associated with capital and 'superstar' business models. While negotiations will have been going on for longer, it has recently been announced that Amazon will purchase Deliveroo, for example.⁸⁹ In this context, and in light of wider likely mergers and acquisitions through the crisis, commentators have proposed a review of competition law.⁹⁰

As IFOW work finds, those working for these increasingly monopolistic platforms are 'malemployed'. The question for revaluing workers is twofold, both in questions about redistributing wealth generated but potentially, also changing ownership structures over the data – a new form of capital which is becoming concentrated in the hands of a few – which these companies hold.

To reduce capital-bias, policy making in the wake of Covid-19 would need to design-in mechanisms to secure and improve labour's share.

What does this mean for labour markets and the economy in the context of Covid-19?

Local industrial strategy

Globalisation, deindustrialisation and place

Most of the world's advanced economies have experienced deindustrialisation in the last thirty, fifty and one-hundred years. There is little disagreement that deindustrialisation has been happening in the UK where the phenomenon has been particularly pronounced, reducing as a share of total employment from 30% in 1964, to 22% in 1982, to 8% in 2014.

There is disagreement over whether 'technology' is the primary cause of deindustrialisation or 'globalisation' (and offshoring). In practice they drive one another. Changes in technology have increased possibilities for global trade of goods and services, and the movement of capital and people across borders drives technological innovation. It is likely that globalisation and technological change have slightly different consequences, which are sometimes blurred by the phrase 'deindustrialisation'.

While it was assumed globalisation would only continue to accelerate, there has been a retreat from it in recent years, driven in part by political responses to polarisation. This has primarily been viewed at the national scale, with a growing popularity of anti-globalisation, anti-migrant parties across developed nations.⁹¹

However, the patterns of this sentiment are highly spatialised.⁹² This reflects the fact that labour markets, following economic structures, are geographically bound. In turn responses need to be tailored to place.

In the wake of Covid-19 the UK Government is committing to support the "repatriation" of key manufacturing capabilities such as pharmaceuticals as part of a new national 'resilience framework' committing to explore supply chain issues where critical UK businesses rely on components from abroad to make finished products. Devolved administrations will rightly look to shape the way any future industrial strategy relates to their characteristics, sector composition, and aspirations of their population.

In this context, the concept of resilience, as linked to sectors and the work they infer, should be thoroughly interrogated. Resilience theory is divided into engineering or 'single equilibrium' approaches, in which mechanisms are sought to bounce back to a known, previous state; or multi-equilibrium approaches, in which it is believed that systems can persist in multiple states. The latter demands more attention is paid to questions about what society we want to live in, and what economy to build.

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In the wake of Covid-19, dialogue about what a fair and sustainable future of work looks like, and support for workers in transition, is increasingly necessary.

Conclusions

Schumpeter (1939) argues that ‘creative destruction’ resulting from technological change is episodic. This challenges the idea of RBTC as gradual and incremental, and acknowledges that often shocks are responsible for significant changes in business strategy and form. Current evidence strongly suggests that the existing pressures on labour markets which arise from or interact with technological transformation will be accelerated by Covid-19. The question for analysts and policy makers alike is not only to understand how; but also to learn from recent history what we cannot leave to chance.

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