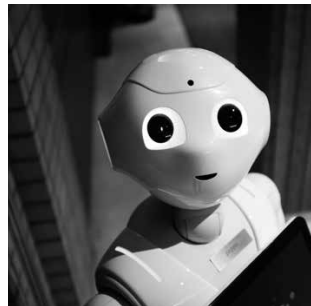


THE FUTURE OF WORK

Part I: State of the Nation

June 2018



The Future of Work
Part I: State of the Nation
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About the Centre for Social Justice

Established in 2004, the Centre for Social Justice (CSJ) is an independent think tank that studies the root causes of Britain's social problems and addresses them by recommending practical, workable policy interventions. The CSJ's vision is to give people in the UK who are experiencing the worst disadvantage and injustice every possible opportunity to reach their full potential.

Since its inception, the CSJ has changed the landscape of our political discourse by putting social justice at the heart of British politics. This has led to a transformation in Government thinking and policy. The majority of the CSJ's work is organised around five 'pathways to poverty', first identified in our ground-breaking 2007 report, *Breakthrough Britain*. These are: family breakdown; educational failure; economic dependency and worklessness; addiction to drugs and alcohol; and severe personal debt.

In March 2013, the CSJ report *It Happens Here* shone a light on the horrific reality of human trafficking and modern slavery in the UK. As a direct result of this report, the Government passed the Modern Slavery Act 2015, one of the first pieces of legislation in the world to address slavery and trafficking in the 21st century.

The CSJ delivers empirical, practical, fully funded policy solutions to address the scale of the social justice problems facing the UK. Our research is informed by expert working groups comprising prominent academics, practitioners and policy-makers. Furthermore, the CSJ Alliance is a unique group of charities, social enterprises and other grass-roots organisations that have a proven track record of reversing social breakdown across the UK.

The 13 years since the CSJ was founded has brought with it much success. But the social justice challenges facing Britain remain serious. Our response, therefore, must be equally serious. In 2018 and beyond, we will continue to advance the cause of social justice in this nation.

Acknowledgements

With Thanks to the Sponsors of the Future of Work Programme



With additional thanks to B.E. Wedge Holdings.

Chief Executive's Foreword

At time of writing, there are more people in work across Britain than at any time on record. 32 million people have the dignity and purpose that comes with a pay check, something that we should be proud of.

However, there is an alarmist belief that this record employment rate is under threat from an onslaught of globalisation, automation and Artificial Intelligence (AI). Many believe that robots will slowly usurp the need for machine operators in factories, algorithms will replace the need for insurance underwriters and financial analysts, and AI will replace the need for customer service agents. These fears aren't without support. Researchers at Oxford University have predicted the computerisation of different roles within an economy and forecast that almost half of all jobs in America could be automated within the next generation.

The argument goes that while technology continues to make roles and entire industries redundant, so globalisation will continue to put downward pressure on wages. Global power centres are shifting from West to East, and as low-cost producer countries such as China move up the value curve, so British workers in higher value industries will have to continue to improve their productivity and become more price competitive.

The alarmists paint a dystopian view of the future, with mass unemployment where a small group of capitalists enjoy the fruits of economic growth. No-one can help feeling concerned about poverty and inequality in this future world of robot workers, dependence on state hand-outs, and barren industrial landscapes.

The CSJ therefore approach this subject of the future of work intent on understanding how we can avoid the downtrodden stagnation that some predict. We were founded on the principle that work is the best route out of poverty, and therefore we want to help create policy ideas that do not just grow the number of jobs available but increase the opportunities for in-work progression and career advancement. If we succumb to the nihilism outlined above, we would be doing a grave disservice to the millions of people who in recent years have been able to get a job, earn a pay-check and become independent of state support for the first time in their lives.

Over the following year, we will examine the UK labour market, gain a better understanding of the challenges we face and then set out to produce a policy platform that supports the most disadvantaged continue to get access to good well-paid work in the future.

This report by Dr Gerard Lyons and Patrick Spencer on the future of work is important because work remains a fundamental institution in our economic, social and cultural framework. It remains a route for people to regain independence and help themselves out of poverty. We must therefore work hard to ensure the future of work continues to deliver for people in this way.

Andy Cook
CEO

The Future of Work Programme: Overview

The Future of Work research programme was conceived in response to the 2017 report by the Centre for Social Justice (CSJ), *The Great British Breakthrough: Driving productivity growth in the UK*. That report concluded that there were several significant barriers to productivity growth in the UK and proposed a whole series of policy initiatives to address this. The barriers included: low investment, including low capital investment across the UK economy that had resulted in a slow take-up of new technologies and a low rate of investment in training of staff; a regional growth imbalance, explained by many factors including the deindustrialisation of large parts of the Midlands and North of England and by the competitive strength of London; and a lack of occupational mobility in the labour market, alongside low wage growth, that led a large number of people to just manage in low paid and low skilled work for the majority of their working lives.

Where *The Great British Breakthrough* was retrospective, this report aims to look to the future. Work is changing, both here and across the globe, and Britain needs to be prepared for this. This has implications for people, for businesses, and for policy makers in Westminster, who need to be aware of the drivers of change, prepared for them and positioned for the future. If not, then Britain will not succeed in tackling the drivers of low productivity, issues connected with low pay and low skills, or in maintaining high levels of employment.

This research programme seeks to better understand the future of work, and in particular its impact on those at the bottom of the ladder. In order for the UK to have informed policy decisions and look after its most vulnerable, there is a need to understand fully the changes that are occurring, and could take place, in the world of work. These include socio-economic change, demographic trends, technology advancements, greater levels of globalisation, evolving skill demands and a cultural shift among younger workers. Informed policy decisions should help ensure employment rates remain high and that no one is left behind, allowing the market mechanism to work properly and intervening where needed. Work is a vital route out of poverty and central to future prosperity.

Structure

This paper is the first in a series of five separate reports, as part of The Future of Work Programme:

- I. Working in Britain Today – State of the Nation
- II. Securing a Regional Dividend – Boosting Jobs Growth across Britain
- III. Embracing Technology – Understanding how Technology can be a Job Creator, not a Job Killer
- IV. A Skilled Workforce for the Future – Preparing our Workforce for the Future of Work
- V. The Supply of Labour – Population Growth, Immigration and an Ageing Workforce

Working Group

- Ben Houchen, Tees Valley Mayor
- Dr Adam Marshall, Director General, British Chamber of Commerce
- John Mills, CEO, JML Ltd
- Dame Helena Morrissey, Head of Personal Investing, L&G
- Chris Oglesby, CEO, Bruntwood
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- Dr Gerard Lyons, Chair of the Working Group

Introduction

Work has long been a foundation in western economic systems. It is a source of income, identity and dignity for people. While the British economy has evolved from its agrarian roots, through the industrial revolution and in to the modern knowledge-based economy we have today, the role of work as an economically and socially important cornerstone of our culture has not changed.

Today, particularly for those on low incomes, or at the bottom of the income threshold, there are undoubtedly many similar issues to the past, including the need to find work and be fairly rewarded for carrying it out. But, also, as we outline here, there are some significant differences, with new challenges, and perhaps also new opportunities to the past.

Economic policy in modern Britain has always primarily focused on getting people into work. Often this has been achieved through creating an environment for the private sector to invest and grow, creating jobs in the economy. Today employment rates are high, with more people in work than at any point since records began. British businesses trade with economies around the world and our cities are hubs of commerce. This has helped ensure Britain is one of the largest economies in the world.

However, the last decade, since the global financial crisis, has marked a change. Low productivity, low wages and in-work poverty have become even more central issues than in the past. Median incomes have just surpassed pre-financial crisis levels. The rise in in-work poverty across parts of the country has partly been driven by a sharp increase in the cost of housing and while the British population continues to work into late age (causing a significant age demographic shift), men are more likely to be unemployed, working fewer hours and part time than at any point in history.¹

Increasingly, employment and wage prospects are impacted by global factors. Research by the World Bank looked at the evolution of the global income distribution during the period between the fall of the Berlin Wall to the beginning of the global financial crisis. It highlighted the challenge from globalisation to those on low incomes in the west. Among those, *“that 20 years later turned out to have been the least successful part of the global income distribution, 86 per cent came from mature economies”*.² If that happened before, we should be prepared for a repeat, with low income earners facing the most pressure. The nature of employment is changing and will continue to change. Technology is having an increasingly large impact on the world of work – with implications for those on low incomes, in low skilled or repetitive jobs, and introducing competitive pressures higher up the income scale.

1 For a good discussion on this issue see Robert Joyce, IFS, ‘Poverty and low pay in the UK: the state of play and the challenges ahead’ www.ifs.org.uk/publications/11696 (March 2018)

2 World Bank, Development Research Group, Global Income Distribution, From the Fall of the Berlin Wall to the Great Recession, Policy Research, Working Paper 6719, (December 2013)

In recent years globalisation has put pressure on jobs across the globe – and while the focus has often been on manufacturing and agriculture, services are impacted too – leaving some communities and regions without any source of new jobs and incomes. The UK has not been immune. People in London and parts of the South East have greater opportunities in a diverse number of skilled and well-paid jobs across high growth industries. Median wages in London are 44 per cent higher than in the North East, while more than half of all 1.3 million jobs in the British Information and Communication Technology (ICT) industry are located in London and the South East. In recent years there has been a large increase in the number of people operating in informal areas of employment such as casual agency workers and zero-hours-contracts as well as more employment in the gig-economy.

However, as we outline below, while it is good to see the UK generating so many jobs, even in challenging economic times, there are considerable numbers in low pay. There have been other changes too, such a decline in trade union membership and that migrant labour is a larger portion of total employment than at any point in history. Combine this with a decline in mid-level technical jobs (predominantly found in the manufacturing industry), as well as a greater demand for higher level educational qualifications – the world of work as we know it has and continues to change. Moreover, the UK is one of the biggest service sector economies in the world, with an economy that is more open and adaptable to change.

So, what does the future of work look like? The reality is that the nature of what we do as well as how and where we do it will change.

Globalisation will increase the fluidity of goods, services, capital, people and ideas across national boundaries. Global power centres will change, with China due to overtake the US as the largest economy in coming decades. Technology will change the type of jobs available and the nature of our daily working lives. Academics Frey and Osborne at the University of Oxford believe that between a third and half of jobs in western economies such as the US and UK could be automated³ (although other estimates differ from this). Demographics will continue to change, with a larger portion of the British workforce estimated to be over the age of 50 in the future. How will changing demographics impact work? Younger workers may have new and different needs. Higher education graduates have shown increasing interest in flexible working, having multiple careers, and working across a wider geographic and competency-based teams. Those with lower skill attainment will need training support to remain valuable in a more global labour market. Business models are also changing, with big companies becoming more flexible and representing smaller parts within a wider economic ecosystem.

These changes will continue to benefit the well educated in skilled professions. It also seems that these changes could result in the hollowing out of middle tier and professional roles. Life in low skilled low paid employment also looks increasingly precarious. Automation will have a big impact on manufacturing and the retail industry, both major employers in the UK. The wage gap between students who reach level 2 and level 3, 4 and 6 continues to grow,⁴ meaning the 40 per cent of students who leave education without passing their

³ Frey, C. and Osborne, M., *The Future of Employment* (University of Oxford, September 2013)

⁴ ONS, *Earnings by Qualification, 2011* (24 August 2011)

Maths and English GCSEs are at an instant disadvantage in the labour market. And while employment rates are high, and many areas of the UK report a relative shortage of labour, the opportunities for progression are falling as companies invest less in staff up-skilling and mid-skilled technical jobs fall in number due to globalisation or technology.

So, if British economic policy wants to continue its primary focus on maintaining record high employment rates and steady wage growth – policy and law makers needs to be more aware of these changes, and the effect they will have on all workers.

The aim of this research programme will be to answer the questions of how policy can support future high employment rates, good employment, wage growth, and economic opportunity. The Centre for Social Justice was founded upon the principle that work is the best route out of poverty – unless we endeavor to ensure that work remains an institution that offers an income, an identity, and dignity, we risk allowing many of the most disadvantaged to fall back in to a world of welfare dependency and poverty.

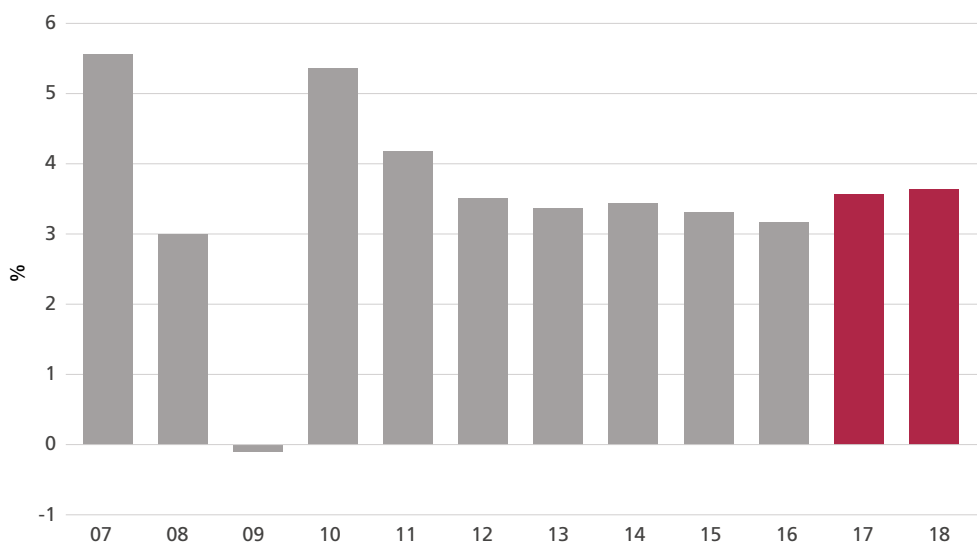
chapter one

What is happening to employment?

Global growth and trends

In the wake of the 2008 global financial crisis, there has been a general tendency to be negative about global growth prospects, but this negative narrative has not been entirely accurate. While global growth has slowed, it has still been steady. Figure 1 shows the annual rate of global economic growth. In the decade before the financial crisis, the world economy grew by an average of 4.2 per cent per year, using the International Monetary Fund's (IMF) main measure of growth. In the decade since, growth has averaged 3.4 per cent per year. This represents a significant slowdown, although the reality is that 3.4 per cent is a steady pace of growth. At this rate of growth, the world economy would double (in real terms) in only 21 years, boosting global incomes considerably. The pace pre-crisis was clearly exaggerated by many of the factors that triggered the crisis, particularly in the West. Now, after strong growth of 3.9 per cent last year the IMF is predicting a similar rate to this, although a current worry is how resilient growth will be to any sustained tightening of monetary policy.

Figure 1: Global economic growth (annual per cent change)

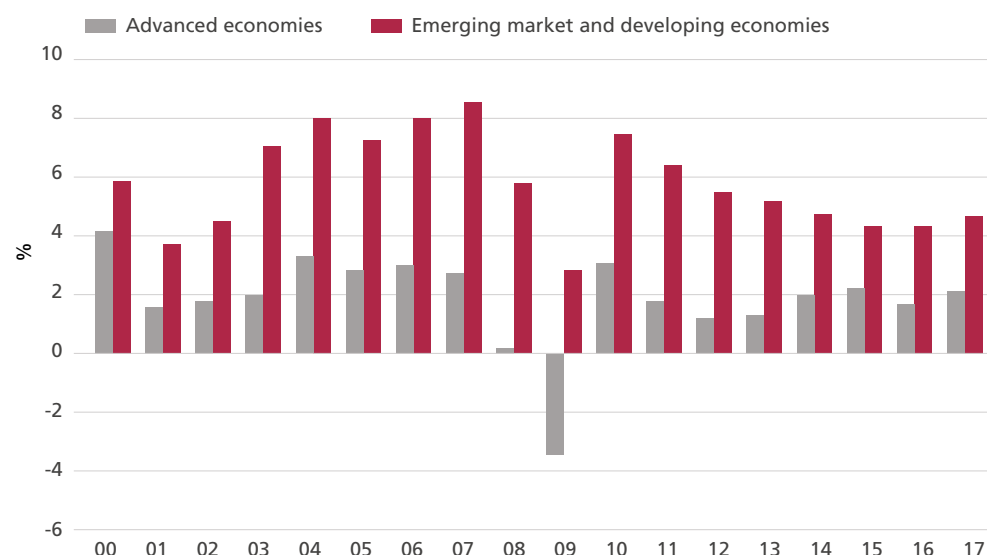


Source: International Monetary Fund

Just as important as the future rate of growth, is where that growth is likely to come from. This will have a significant bearing on where future jobs need to be – and are likely to be – created, and how much they will pay. Indeed, as we have seen in the UK, while employment growth has been strong in recent years, wage growth has been sluggish, with real incomes (that take account of wage growth relative to inflation) being squeezed.

One important observation is that there will likely be a continuation of the shift in the balance of global economic power from the advanced Western economies to the Rest of the world. In the past growth in the emerging world was heavily dependent upon growth in the West, and while this is still important, over time, growth across emerging regions like Asia, Africa and the Americas will become less dependent upon what happens in the US and western Europe. As we note below, citing analysis from the World Bank, this has already suppressed wages of those in low skilled jobs in the West and also triggered a hollowing out of jobs from western economies.

Figure 2: Economic growth in the advanced economies versus emerging and developing economies (annual per cent change)



Source: IMF

While western economies have continued to create jobs, the issue has been more about how much those jobs pay. The US compares the hourly cost of manufacturing with other countries. Admittedly this is only one area, but it is illustrative of the challenges ahead. The latest data for 2016 shows that on a scale where the US is 100, the highest hourly compensation is in Switzerland at 155 then Norway at 126, meaning in Switzerland compensation is 55 per cent higher per hour than in the USA.⁵ Other notable countries are Germany 111, France 97 and the UK 73. But the scale of the international challenge for those on low wages in the UK is highlighted by the five countries at the bottom, whose hourly compensation in manufacturing is lowest, these are Poland 27, Brazil 20, Turkey 16, Mexico 10 and Philippines 5. China is not on the list but while its wages have been rising

⁵ The Conference Board, International Comparisons of Hourly Compensation Costs in Manufacturing, 2016 – Summary Tables (February 2018) [accessed via: www.conference-board.org/ilcprogram/index.cfm?id=38269]

in recent years it is still exerting a disinflationary competitive pressure on wages elsewhere. Nonetheless, the message is that intense global competition will add to competitive pressures on western economies. Indeed, in our view, wage growth has been influenced by a combination of factors, including the demise of unions, globalisation, technological change and also the role of the financial sector – issues we will explore in future papers, as they impact those on the fringes of employment.

Where wage growth has been modest, this has reinforced a negative tone about the outlook – and led to recommendations such as the need for greater intervention in the labour market in the form of trade protectionism, higher welfare spending and tighter labour market regulations. Notwithstanding these interventions though, the reality is that the UK will continue to face competition from emerging economies, many of whom also want to increase their share of production and high value jobs.

Also, future global growth is set to come more from cities. This will add to pressures on the UK. There is a strong correlation between urbanisation and rising per capita incomes; this is perhaps a reflection of people being attracted to higher paid jobs within cities. Currently 600 cities that contain one-fifth of the world's population account for half of its output. Of this 600, 157 are currently in the advanced economies. But in 20 years' time, while the top cities are expected to then account for far more of global output, the number that are found in the West is expected to decline to only 20.⁶

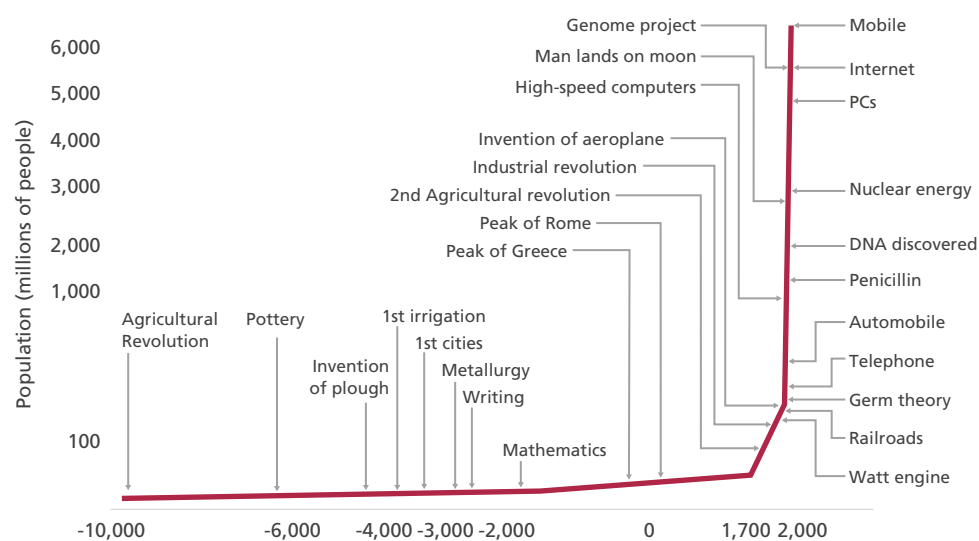
Many of the new cities, will have sustainable housing, transport, infrastructure, generating new types of jobs. This is already leading to a focus on smart cities that use technology. It also raises questions about the adaptability of employment. What are the implications for where people live and how they afford to live – do they need longer-term financial commitments like mortgaged homes or will they need to be more flexible about their ability to move for work? Labour mobility may matter more in the future.

As well as global power shifts and increasing urbanisation, there have been and continue to be two other major drivers that have defined global economic performance; population growth and technology.

Figure 3 shows how the present period is unique: a huge increase in population and in technological change. The technology change is likely to be both evolutionary (steady change) and revolutionary (with dramatic change in working practices). The components of the fourth industrial revolution that we are now experiencing across the globe include many things each of which on their own would be significant, such as artificial intelligence and robotics, a data and digital revolution, a green revolution, stem cell research and major advances in medicine, clean technology and biotech, nanotechnology, and the ability to produce customised goods in remote places using digital technology. Such technological change also points to more jobs being transferable and to new skills being needed.

⁶ McKinsey, *Global cities of the future: An interactive map* (March 2011) [accessed via: www.mckinsey.com/global-themes/urbanization/global-cities-of-the-future-an-interactive-map]

Figure 3: Technology and population growth combined



Source: BofA Merrill Lynch US Equity and Quant Strategy, Robert Fogel, University of Chicago. Published in 'Global Investment Strategy. The Longest Pictures' research by BofA Merrill Lynch; 22.02.15

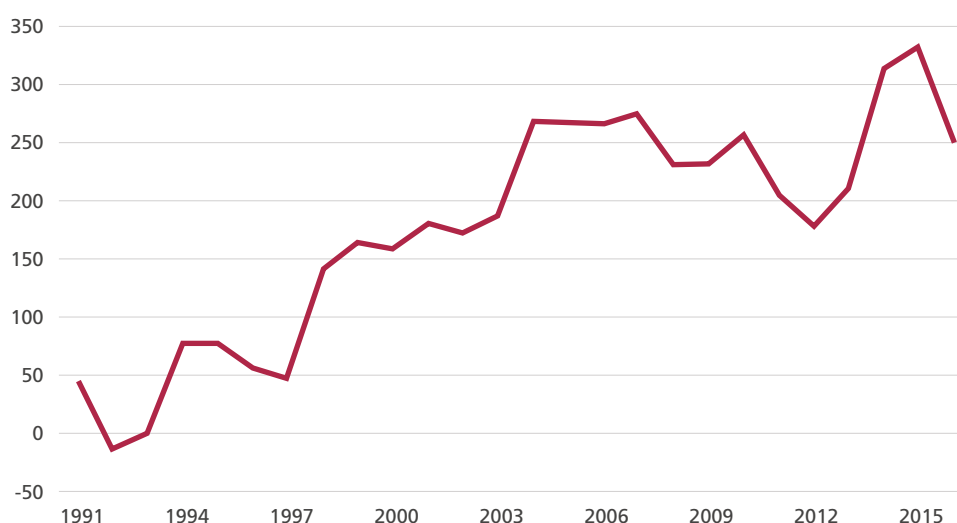
Historically, many waves of technological change have transformed the world of work, and the current phase of technological progress will add to the complexity. While new automation and digital technologies will pose further challenges their impact will be uneven across countries as well as across sectors, and between younger and older workers. Also, as highlighted, it is not just the pace of global growth but where it will come from and how it is likely to change.

Population dynamics will continue to change – with young populations across Africa, South Asia and the US, among others, but ageing populations in much of Western Europe and in north-east Asia among Japan, South Korea and China. As a number of western countries will be impacted by the same factors – directly by the impact of an ageing population at home and indirectly by the consequences of large younger populations elsewhere competing for jobs, there may be common policy solutions that are proposed. The UK, with its growing population will also have a relatively young population, even though there will be more older workers too.

The more immediate consequence of demographics are seen in multiple ways: intense international competition driving production to where it is cheapest and suppressing the wages of unskilled workers. Then there is the impact on migration flows. There is considerable migration across the world and much of it is legal. According to the World Bank in 2016 there were 247 million people, 3.4 per cent of the world population, who live outside their home country. The top destinations for migrants are the USA, Saudi Arabia, Germany, Russia and the United Arab Emirates followed by the UK. Most are economic migrants, who move in search of a better life and often send money back home to families. In 2015 such global remittances were a huge \$601 billion, far in excess of the amount governments spend overseas through development aid.⁷

7 World Bank, "Migration and Remittances Factbook 2016"

Figure 4: UK long-term net international migration (1000s)



Employment, Unemployment and Labour Activity in the UK

Data on unemployment dates from a collection of sources, the 1851 population census, administrative based systems dating from 1881 and the survey-based data that began in the early 1970's. However, it would be wrong to interpret this as a continuous, comparable series. The series of statistics based on administrative sources which span the last 100 years consist of six separate series each based on a different definition. The potential coverage of these statistics has expanded from the small pool of about one million, mostly male, trade unionists which existed towards the end of the 19th century, to today's 32.15 million people in-work,⁸ with a larger portion than at any other time in modern history that are women and the self-employed.

In its present, comparable form, jobs and unemployment data dates from the early 1970s. In many respects the early 1970's is a good time to start comparable analysis. That marked the end of the golden era of post war growth for Western Europe, it ushered in the modern era of floating exchange rates with the collapse of the Bretton Woods system and also saw the OPEC crisis that forced oil prices higher. The 1970's marked a difficult time for western economies, including the UK. The decade saw energy crises, a three-day week, rising inflation, and an income and prices policy culminating in the 1978–79 winter of discontent. The deep recession at the start of the 1980's saw unemployment soar to a previously unimaginable figure of over three million, combined with regional challenges, some of which still linger today.

Despite this regional variation, there has been an upward trend for the number of people in work since the 70's, albeit with some significant setbacks along the way, during the downturns in the early 80's, early 90's and 2008/9. No-one should underestimate the pain suffered in those downturns by those who lost their jobs. The employment rate shows that the recent performance of the labour market has been unique.

⁸ ONS, Labour Market Bulletin (February 2018) [accessed via: www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/uklabourmarket/february2018]

Since 2011, there has been a surge in the employment rate to 75.4 per cent in February and the highest since records began in 1971. In fact, there are now 32.15 million people in work. One of the lingering issues in recent years has been the working poor, with sluggish wage growth, resulting from many factors including intense global competition, the demise of unionized labour, technology and financialisation. There are many who are concerned that this will continue, particularly as new technology takes hold.

To quote a 2015 OECD report,

The OECD (2012) has observed, for example, that over the period from 1990 to 2009 the share of labour compensation in national income declined in 26 out of 30 advanced countries for which data were available and calculated that the median (adjusted) labour share of national income across these countries fell from 66.1 per cent to 61.7 per cent. A more recent OECD calculation finds that the average adjusted labour share in G20 countries went down by about 0.3 percentage points per year between 1980 and the late 2000s. Similar downward trends have been observed by other international institutions.⁹

The TUC, too, found a declining share of wages in national income, and while it had fallen in the UK, the actual share of wages was higher in the UK than it was in other major economies, such as France, and Germany.¹⁰ There are valid concerns that this squeeze on wages will continue as new technology takes hold. Diffusion of information and communication technology (ICT) has been shown to boost innovation, and invention of new and cheaper capital goods, thus substituting for low skilled works. To quote that same OECD report, "ICT capital accumulation appears to have had an especially negative effect on the lowest educated."¹¹

The current unemployment rate at 4.2 per cent (as of February 2018¹²) is at its lowest point since the early 70's. The growth in the employment rate has partly been driven by fewer people unemployed, but also a growing number of people who were previously considered inactive. The economic inactivity rate in the UK has fallen from 23.3 per cent in May 2010 to 21.6 per cent today.¹³ This decline in labour inactivity is a consequence of different factors; changing economic conditions (increased cost of living), changing cultural norms (women are far more likely to work today than in the 20th century) and changes to welfare conditionality.

9 "The Labour Share in G20 Economies", International Labour Organization Organisation for Economic Co-operation and Development. Report prepared for the G20 Employment Working Group Antalya, Turkey, 26-27 February 2015

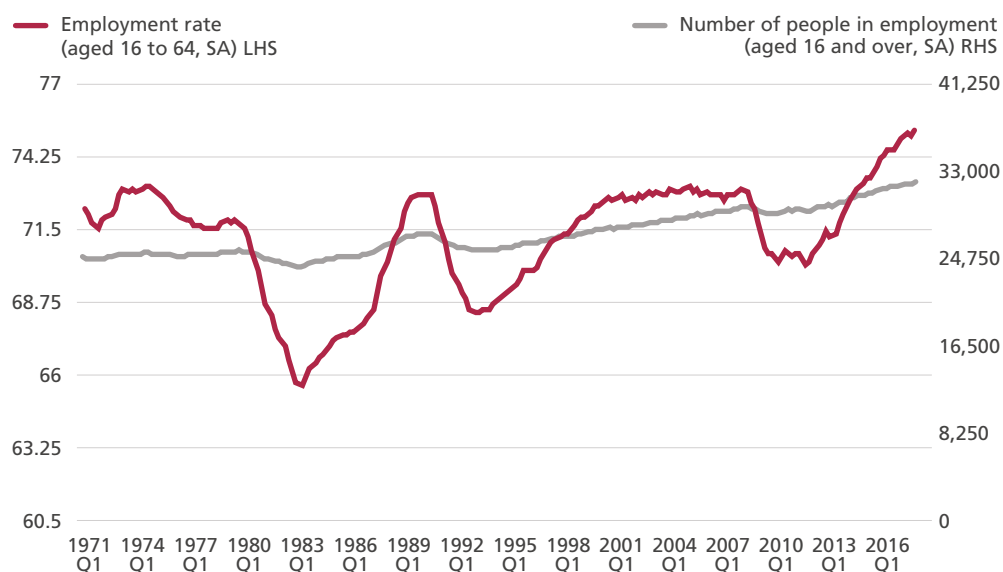
10 For a study of financialisation and the role of finance see Andrew Smithers, "The Road to Recovery: How and Why Economic Policy Must Change", where he "showed that the payments of bonuses to senior executives that triggered short-term behaviour, in turn impacting economic growth" according to Anthony Hilton, Evening Standard, 25/03/2014, "Calls for change to an absurd system" www.standard.co.uk/business/markets/anthony-hilton-calls-for-change-to-an-absurd-system-9214698.html

11 See ref. 8, page 15

12 See ONS press release, 17th April 2018, on UK labour market: February 2018 www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/uklabourmarket/latest

13 ONS, LFS: Economic inactivity rate: UK: All: Aged 16-64: per cent: SA [accessed via: www.ons.gov.uk/employmentandlabourmarket/peopleinwork/economicinactivity/timeseries/lfs2s/lms]

Figure 5: Number of people in employment and employment rate from 1971 to today



Source: ONS

Gender, migration, and age

The increase in employment in recent years has largely been driven by an increase in the number of economically active women in the UK labour market. There are 15.1 million women in work today, an increase of almost a third since 1992.¹⁴ In February 2018 the female employment rate was at 71.2 per cent and has been on an upward trajectory since records began in the early 70's, when the female employment rate was 52.8 per cent.¹⁵ At the same time the male employment rate has fallen from 92.1 per cent to 79.8 per cent.¹⁶

Chart 6 highlights the significant increase in female employment over the last 25 years especially the large increase in self-employment. Half of all women working in Britain today work in three industries; human health and social work activities, education, and retail. These industries pay marginally below average wage for the UK, and jobs are fairly spread geographically across the country.¹⁷

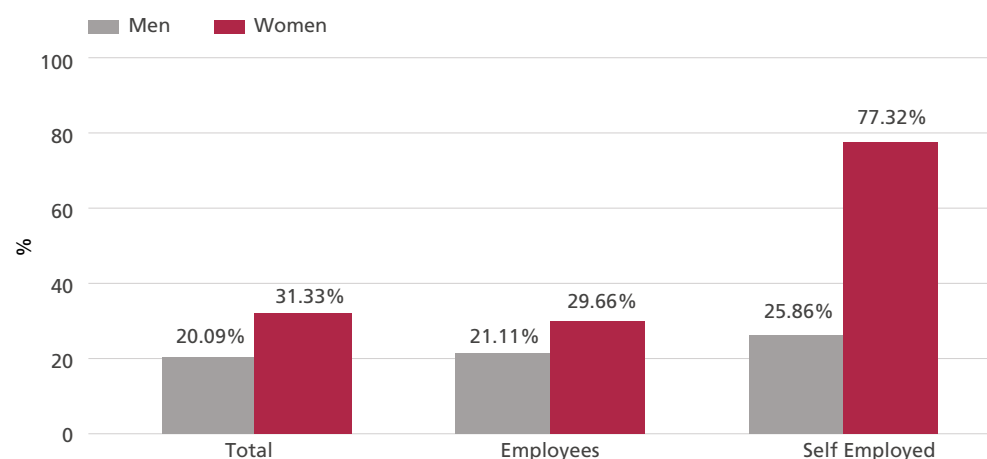
¹⁴ As of October–December 2017

¹⁵ ONS, *Female employment rate (aged 16 to 64, seasonally adjusted)* [accessed via: www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/timeseries/lf25/lms]

¹⁶ ONS, *Male employment rate (aged 16 to 64, seasonally adjusted)* [accessed via: www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/timeseries/mgsv/lms]

¹⁷ ONS, EMP13; *Employment by Industry* [accessed via: www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/employmentbyindustryemp13]

Figure 6: Percentage Growth in Employment March 1992 – October 2017 (ONS)

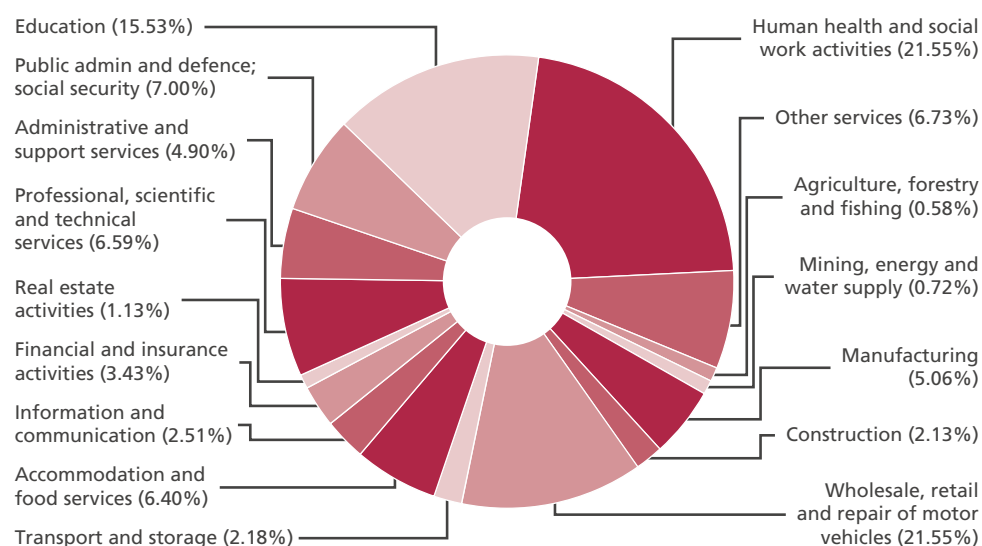


Source: ONS

Men on the other hand, work across a more varied collection of industries. More than half of the 17 million male workers in the British economy work across five industries; wholesale retail (13.2 per cent), manufacturing (12.8 per cent), construction (12 per cent), professional, scientific and technical activities (7.9 per cent) and transport/storage (7.5 per cent).¹⁸

Men are more likely to work in higher paying industries, such as manufacturing, financial services, professional, scientific and technical activities, and ICT. But the industrial make-up of male employment presents the problem of automation disproportionately effecting genders – of the five industries most susceptible to automation, four are major employers of men whereas the female dominated education and health and social care industries are less susceptible.

Figure 7: Where women work in the British economy

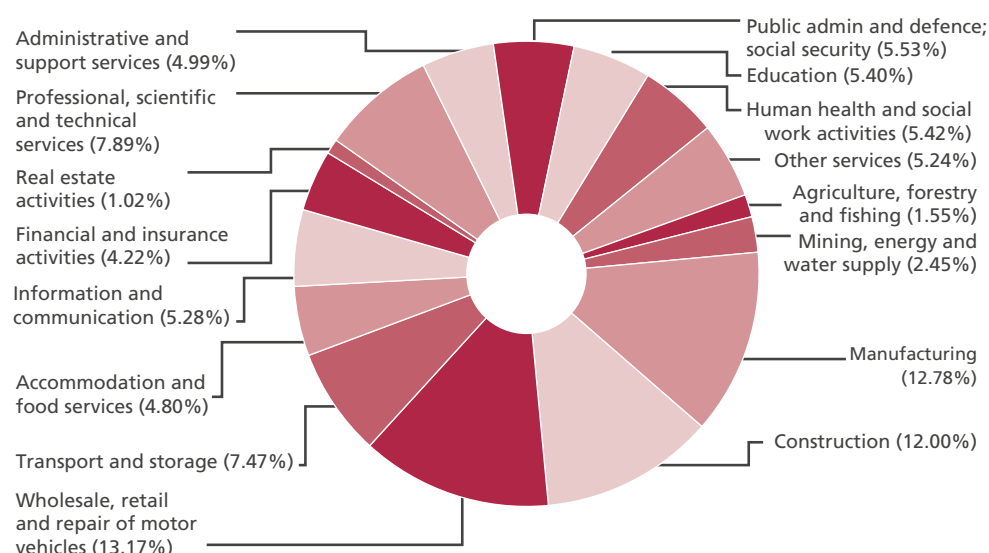


Source: ONS

¹⁸ ONS, EMP13; *Employment by Industry* [accessed via: www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/employmentbyindustryemp13]

One of the biggest changes has been for low paid men in the economy. Here it is vital to differentiate between hourly earnings and weekly pay to appreciate the change. The change is noticeable in looking at weekly earnings, as fewer men on lower wages are working longer-hours than in the past. This has led to the emergence of men in the lowest 20 per cent of hourly earnings now also working part-time (working less than 30 hours per week) and thus an increase in men towards the bottom of the income threshold.¹⁹

Figure 8: Where men work in the British economy



Source: ONS

There is little doubt that as health standards and life expectancy improve, so the age profile of the British workforce has, and will, continue to change. In 1996, there were 5.2 million workers between the age of 50 and 64.²⁰ In 2016, this had increased to 8.5 million. The rate of employment for 50–64 year-olds had increased too, from 57.5 per cent in 1996 to 70.6 per cent in 2016. The rate of older workers either unemployed or inactive has also declined significantly. More people are working in their later years. Whether this is through choice or need is difficult to say, but as life expectancy increases, one would not be surprised if this trend continued, particularly in a service sector economy like the UK.

The different demands and characteristics of older workers are highlighted by McNair,

Older workers often work in local, low-skilled jobs regardless of former skill levels (Health and Safety Executive, 2011), which means pay may decrease with age. After age 60 the majority of employees are in low-skilled work, a large minority are in high-skilled work, and there is an increase in employment in the service sector.²¹

19 Joyce, R. 'Poverty and low pay in the UK: the state of play and the challenges ahead' (IFS, March 2018)

20 DWP, Fuller Working Lives: evidence base 2017 (2 February 2017) [accessed via: www.gov.uk/government/publications/fuller-working-lives-evidence-base-2017]

21 From, Government Office for Science, Foresight, "How are work requirements and environments evolving and what will be the impact of this on individuals who will reach 65 in 2025 and 2040?" https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/461437/gs-15-25-future-ageing-work-environments-er18.pdf (last accessed 2 May 2018) citing McNair, S. (2010) A sense of a future: A study of training and work in later life. A report for the Nuffield Foundation. NIACE: Leicester. [accessed via: http://shop.niace.org.uk/media/catalog/product/a/_a_sense_of_a_future_full_report__final_2.pdf]

The policy consequences are that older workers need more support in adapting to new uses of technology, the application of new skills as well as increased physical and mental healthcare support.

Lastly on migration, the Resolution Foundation estimate that migrants from the EU and EEA account for 7 per cent of the UK workforce. 2.2 million workers in the UK originated from the EU and EEA, an increase of 1.6 million since 2004 (non-EU migrant labour in the UK is approximately 1.2 million).²² EU migrants are most likely to work in food and beverage industry, accommodation industry, the manufacturing of food products and as domestic personal. The decision to leave the EU will have repercussions for the future availability of migrant labour in the UK, and in the issues we mention, one is the need for the UK to adopt a migration policy that best suits domestic needs.

Industry and geography

There has been a significant shift in employment by industry over the last 40 years. Since the late 70's, Britain has seen a significant decline in the number of people employed by the British manufacturing industry. Manufacturing has reduced in size from over a quarter of UK GDP to less than 10 per cent today. Between 1973 and 2007, manufacturing cut 60 per cent of its total workforce, while the sector's productivity increased by a multiple of 2.5.²³ This cut in headcount has not slowed in recent years – since 1997, 1.4 million jobs have been lost. Today there are just under 3 million jobs in British manufacturing.

These manufacturing jobs were predominantly found outside of London and the South East. Thus, deindustrialisation had a profound impact on some regional economies. Today, the manufacturing industry can largely be found in the midlands (Staffordshire, Derbyshire, Nottinghamshire, and Lincolnshire) as well as the North West (Cumbria and Lancashire) the North East (Tees Valley, Middlesbrough and Sunderland) and South Wales. The biggest employer by industry in the UK remains retail, where 4.2 million people work. Education and Human Health and Social Work employ 3.3 and 4.1 million people respectively.²⁴ The other major employers include Manufacturing (2.9 million), Construction (2.3 million) and Professional, Scientific and Technical (2.3 million).

Jobs growth has been focused in the service sector, and specifically in quasi-public-sector industries of Education and Human Health and Social Work. Between 1997 and 2017, 2.4 million jobs have been created in these two industries. Over that same period, ICT, Administrative and Support Services, and Accommodation and Food Services have seen growth of approximately 500,000 jobs each, while the Professional, Scientific and Technical industry has seen 842,000 new jobs.

22 ONS, International immigration and the labour market, UK: 2016 [accessed via: www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/internationalmigration/articles/migrationandthelabourmarketuk2016]

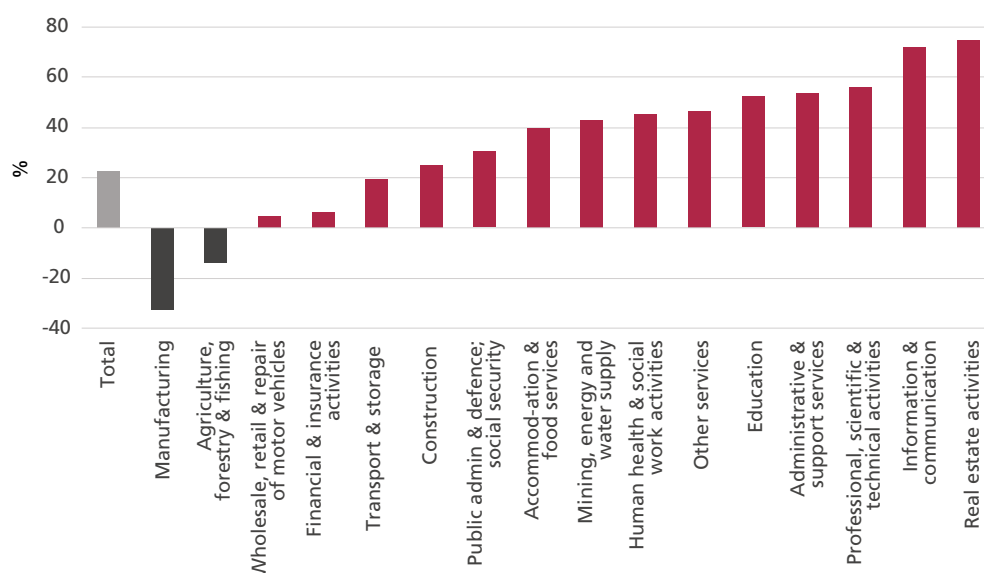
23 Kitson, M. and Michie, J. *The Deindustrial Revolution: The Rise and Fall of UK Manufacturing* (University of Cambridge, June 2014) [accessed via: www.cbr.cam.ac.uk/fileadmin/user_upload/centre-for-business-research/downloads/working-papers/wp459.pdf]

24 ONS, EMP13; Employment by Industry [accessed via: www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/employmentbyindustryemp13]

The geographic spread of these new jobs varies. Bernick, Valero and Davies (2017) posit that the geographic spread of industries follows three patterns; uniform, scattered, and single hub. Education and Human Health and Social Work is fairly evenly spread across the country (as are retail jobs and the agriculture industry). High value jobs in the Professional, Scientific and Technical industry are generally quite scattered with areas of strength around Cheshire and Greater Manchester, Buckinghamshire, Bedfordshire and Hertfordshire (Oxford to Cambridge corridor) and West London. Lastly the high value technology jobs in the ICT industry are broadly focused in urban hubs (East London, Edinburgh and to a lesser extent Manchester).

The reality is that job growth and decline do not happen synonymously. Jobs lost due to a steel works closure in Redcar does not mean new jobs in growth industries are created to replace them. Workers in Redcar are more likely to be faced with the options of either changing location or changing industry as a result of their loss of an employer.

Figure 9: Jobs Growth by Industry in the UK 1997–2017 (ONS)



Source: ONS

Low pay remains stubbornly high

While extreme low pay (which can be better described as predatory employment or slavery) has become increasingly rare in the UK, there remains a stubbornly high number of low paid jobs.²⁵ In 2018 DWP data showed 5.85 million people were classed as having persistently low income (before housing costs were calculated).²⁶ This is an increase from 2016 when the Resolution Foundation estimated there were 5.1 million people in low paid work (approximately 19 per cent of the total UK workforce).²⁷ This proportion of low paid workers in the economy has changed little since the financial crisis.

²⁵ Low pay is defined as earnings at 2/3rds of median wages.

²⁶ Department for Work and Pensions, Income Dynamics: Income movements and the persistence of low incomes (March 2018)

²⁷ D'Arcy, C. *Low Pay Britain 2017* (Resolution Foundation, October 2017) [accessed via: www.resolutionfoundation.org/app/uploads/2017/10/Low-Pay-Britain-2017.pdf]

The consistent high level of low paid work has in part been driven by a hollowing out of mid-level jobs and stable growth in low skilled work. As mid-skilled technical roles have fallen in number, there has been an increase in both low skilled low paid jobs and high skilled professional management positions. Research from the University of Oxford shows that for every 20 mid-skilled, 11 new jobs are low skilled and nine are high skilled.²⁸

In the past, low wages have been supported by in-work benefits (such as tax credits). Under the Coalition Government policy shifted towards supporting a higher wage floor, reducing individuals' dependence on welfare. While the introduction of the National Living Wage in 2016 has done a lot to push up wages for the lowest paid in Britain, and a smaller portion of the wage force fall below the low pay line (2/3rds of median pay), there are more workers at or near to the NLW floor.

The majority of low paid and unproductive work in the UK can be found in a small selection of industries, as the CSJ highlighted in its productivity report,

The least productive five industries make up 31 per cent of UK total GVA output (approximately £500.8 billion), but also constitute 54 per cent of total employment (15.5 million jobs). The ten most productive industries in comparison split across high value manufacturing and high skilled service sector industries. However, they make up just a quarter of UK GVA output (£423.2 billion) and just 7.4 per cent of total UK employment (2.1 million jobs).²⁹

The largest industry considered low paid remains retail – it has a median wage of £352 per week and employs over 4 million people.³⁰

The growth in low pay has been partly due to the stagnation of median wages. In the aftermath of the 2008 recession relative flexibility in wages allowed the private sector to keep headcount high while wages declined in real terms. Resolution Foundation data shows real median hourly wages at £13.06 (in 2017 prices) in April 2009. Average wages then declined to £12.13 in April 2014, and still haven't returned to the pre-recession peak.

Progression out of low pay remains infrequent. Work by the Social Mobility Commission (SMC) in 2017 found that just 1 in 6 low paid workers will progress permanently out of low pay (and they are predominantly younger people working part-time while also completing an education qualification). This is below Skelton's 2014 estimation that that 25 per cent progress.³¹ The probability of progressing out of low pay decreases with each incremental year of being in low pay. The SMC also found that roughly half of all low paid workers will move between low pay and mid-level pay throughout their working lives.³² While there has been a historic improvement in the number of people progressing out of low pay (between 1981 and 1991 35 per cent of workers were considered stuck in low pay) in the near term, the trend has been a shift to more people either being stuck in low pay or cycling in and out of it over time.

28 www.ft.com/content/6a8544ae-9d9e-11e4-8ea3-00144feabdc0

29 Centre for Social Justice, *The Great British Breakthrough: Driving Productivity Growth in the UK* (2017)

30 ONS, Annual Survey of Hours and Earnings

31 Skelton, D. *Tackling Low Pay* (Centre for Social Justice, 2015)

32 D'Arcy, C and Finch, D., *The Great Escape? Low pay and progression in the UK's labour market* (Social Mobility Commission, October 2017)

The SMC cites part-time work as one of the biggest factors in driving a worker to be stuck in low pay. Part-time work is often linked to young people seeking out educational qualifications, women choosing to reduce the number of hours they work to look after children, and people who have caring obligations. Being 'stuck' in low pay is more prevalent amongst older workers, and workers outside of London in the North East, East Midlands, West Midlands, Yorkshire and Humberside, and Wales. The probability of escaping low pay was lowest in London, where there is a much higher prevalence of workers who cycle in and out of low pay.³³

As well as working in a collection of low productivity industries, outside of the UK low paid workers (who find themselves stuck in low pay) are more likely to be found in low skilled occupations – elementary, sales and customer service, and caring, leisure and other service occupations.³⁴ These occupations attract people with lower skills. There is a positive correlation between educational qualifications and wage levels. A 2010 ONS survey found a 15 per cent wage premium for a student who achieved A-levels over a student with GCSEs, and an 85 per cent premium for a student with a higher education degree over a student with GCSEs.³⁵

Types of employment

The growth of low pay has been linked to an increase in the prevalence of casual employment in the UK. Casual work includes people working on temporary contracts, through agencies, on zero-hours-contracts (ZHCs), or as contractors in the gig-economy. The facts on this are hard to determine accurately, but the Taylor Review report released in July 2017 stated there were approximately 1.2 million agency workers in the UK, 1.6 million people on temporary contracts, almost 1 million on a zero-hours-contract, and 1.3 million people in the gig economy.³⁶

The economic and social demographics of people in casual employment is varied – younger people are often found working in temporary work or on a ZHC because it offers them flexibility, while first generation migrant labour from eastern Europe or low skilled men and women are more likely to do so due to lack of alternatives. The perception has been that this growth in casual employment has disrupted the balance of rights and responsibilities between employers and employees and reduced the power of a worker to seek protection against unfair treatment. Pay for agency workers is far less than that for a non-agency staffer – what has been called a “pay penalty for an agency worker of 22 pence per hour”.³⁷

33 D'Arcy, C and Finch, D., *The Great Escape? Low pay and progression in the UK's labour market* (Social Mobility Commission, October 2017)

34 D'Arcy, C and Finch, D., *The Great Escape? Low pay and progression in the UK's labour market* (Social Mobility Commission, October 2017)

35 ONS, *Earnings by Qualification, 2011* [accessed via: www.nationalarchives.gov.uk/documents/f0048492-office-of-national-statistics-report.pdf]

36 Department for Business, Energy, and Industrial Strategy, *Good work: the Taylor review of modern working practices* (Gov.uk, July 2017)

37 See Financial Times, 5/12/2016 “UK to have 1m agency workers by 2020” www.google.co.uk/amp/s/amp.ft.com/content/ff371b92-ba32-11e6-8b45-b8b81dd5d080

The Taylor Review commented on this imbalance,

Where employers hold more power than employees, this can lead to poorer working conditions and lower wage levels. This type of power could exist where individuals have little choice over who they work for.³⁸

Former Labour Party leader Ed Miliband claimed that ZHCs were “*undermining hard work, undermining living standards, undermining family life*”.³⁹ Journalist James Bloodworth went undercover in casual employment for six months in Britain, describing it as a

dark, insecure world where low-pay is synonymous with tyrannical landlords, bad bosses and an overwhelming sense of helplessness.⁴⁰

Low skilled occupations are also linked to the prevalence of low pay in the British economy. Low pay is defined as 2/3rds of median hourly earnings and the second column of Table 1 highlights that in some sectors there are a significant proportion in low pay.

Table 1: Pay and proportions in each sector in low pay⁴¹

	Below NMW	Low pay (%)	Ave. pay
Elementary occupations	3.5	53.6	£396.60
Caring, leisure and other occupation services	2.3	33.0	£361.40
Sales and customer service occupations	2.2	47.3	£370.40
Process, plant and machine operatives	1.5	21.7	£472.50
Administrative and secretarial occupations	1.4	15.3	£431.60
Skilled trades occupations	1.2	15.5	£509.80
Managers, directors and senior officials	0.6	4.3	£824.10
Associate professionals and technical occupations	0.5	3.5	£605.60
Professional occupations	0.1	1.0	£733.10

The changing composition of UK employment has been linked to the changing structure of the economy. As the mining and manufacturing industries reduced in size, and jobs disappeared from communities that depended on these industries, so new industries and businesses moved in; online retail distribution centres, call centres, construction site labourers, and warehouse workers. Businesses have been quick to catalyse on nuances within the labour market regulations that reduce the cost of employment by increasing the number of casual employees. There has also been a relative increase in the number of roles at both the higher and lower end of the pay and skill scale. There has been growth in professional occupations, managers and directors as well as in the lower paid care and leisure services. However, there have also been declines in the number of mid skilled roles such as administrative jobs as well as process, plant and machinery operative positions.

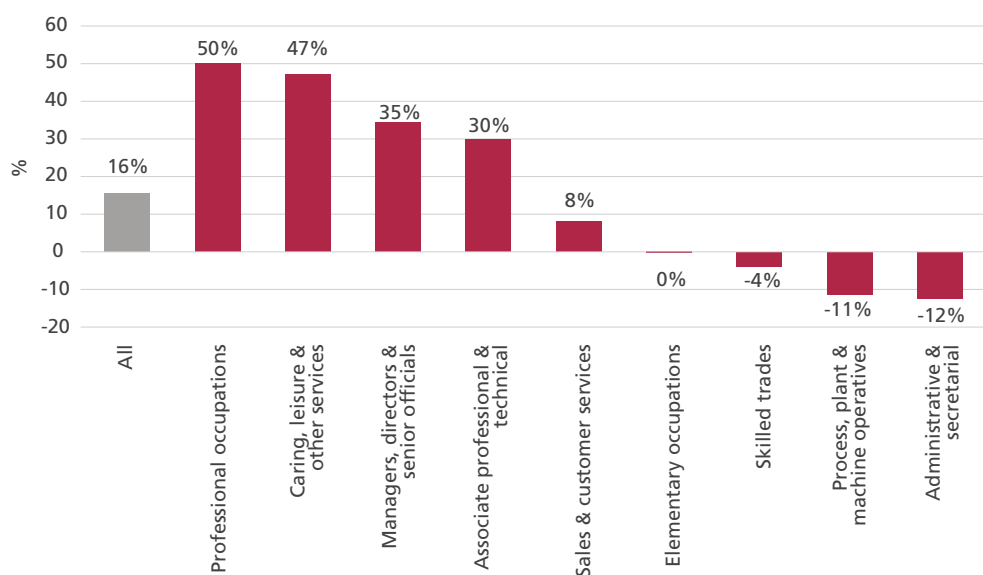
38 Department for Business, Energy, and Industrial Strategy, *Good work: the Taylor review of modern working practices* (Gov.uk, July 2017)

39 www.bbc.co.uk/news/election-2015-32147715

40 Bloodworth, J. *HIRED* (Bloomsbury, London: 2018)

41 Column one showing the proportion paid below the national minimum wage is sourced from: Office for National Statistics (Oct 2016), “Low pay in the UK: April 2016”. Column two showing the proportion in low pay is sourced from: Office for National Statistics (Oct 2017), *Statistical bulletin, “Annual Survey of Hours and Earnings: 2017 provisional and 2016 revised results*. Column three shows median full-time weekly earnings, from ASHE

Figure 10: Job by role classification growth 1997–2017 (ONS)



Source: ONS

In April, the CIPD released its first comprehensive survey of the UK workforce looking at the quality of their jobs in the economy. About 6,000 workers were surveyed, based on seven dimensions, covering: pay and benefits; terms of employment; social support and cohesion; job design and nature of work; work-life balance; voice and representation; and health and well-being. While the results were broadly upbeat, with 64 per cent positive about their work, a substantial minority (13 per cent) felt they might lose their job in the next year, reflecting perceived insecurity. One challenge was, “the risk that workers become trapped in unskilled and casual work”, as well as in lower level professional jobs and skilled manual work. Three profiles of workers were identified: satisfied, (well paid, senior but lacking work-life balance), squeezed (often middle managers, satisfied with work but facing heavy workloads) and those who were stuck. This latter category mirrors those working in some of the low paid areas we outlined above, such as unskilled and casual work. For them, issues identified included underpaid, lacking access to flexible working and voice, underdeveloped and even under-employed.

The Imbalanced Economy

The UK is an imbalanced economy. While the EU referendum result caused a political shockwave, in many respects some of the key themes were brought to attention at the time of the 2008 global financial crisis. These have highlighted that the UK has the following imbalances:

- The size of the financial sector in relation to the economy
- Macro-economic imbalances, including the twin deficits of the budget and current account
- Regional imbalances
- Between London and the rest
- The imbalance of social mobility and “place” and how where you are born and grow up may impact your life chances⁴²
- Between urban and rural, coastal and inland, and between clusters that have seen success versus those that have suffered from previous deindustrialisation and decline
- Between skilled and unskilled workers
- Between old and young
- Between property owners and renters
- Between high earners and the large group on low incomes
- Between those who have gained from globalisation and those who have felt threatened or suffered from globalisation

The interaction of these imbalances varies across the economy and may be complex. But they are, and will, have a bearing on economic growth and future prospects for employment, wages, and those both out of work and experiencing in-work poverty. In part, due to these imbalances, the UK’s recent rate of economic growth has been low. The economy’s annual rate of economic growth since the turn of the century is shown in Figure 9. The low rate of growth post the 2008 financial crisis has focused attention on the UK’s low rate of productivity. Productivity measures output per person, or per time worked. If productivity was higher across the economy then people could work less and/or be paid more. Productivity drives an economy’s output and thus its potential growth rate and, in turn, living standards. So, low productivity economies find it hard to keep up with highly productive ones.

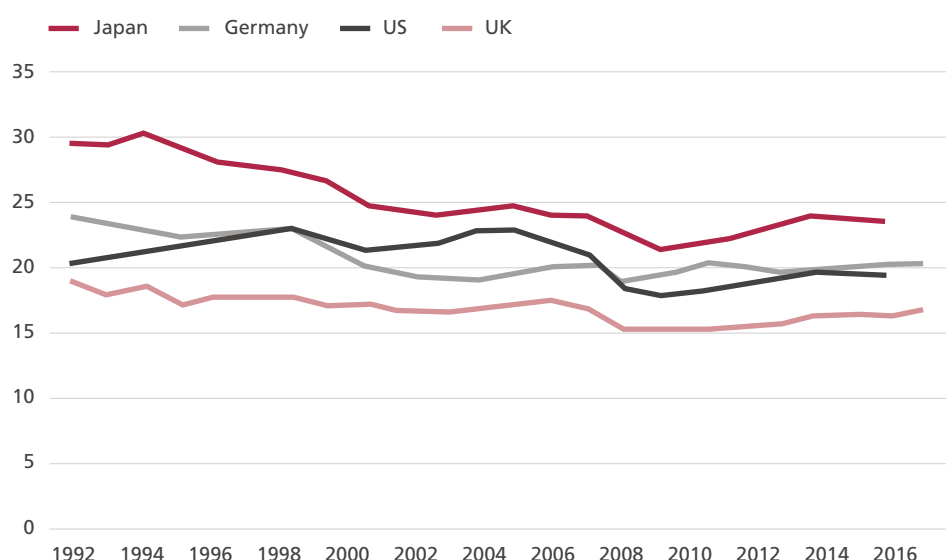
Figure 11: UK Real GDP Growth (annual per cent change, ONS)



42 Social Mobility Commission, State of the Nation 2017: Social Mobility in Great Britain (November 2017)

The UK suffers from a productivity gap across regions, within regions and within sectors too, and the diffusion of productivity gains is low. The CSJ's previous work confirms this and has also highlighted a key macro problem: UK business investment is far too low. The ratio of investment to GDP is shown in Figure 12 for the UK versus the US, Japan and Germany. This has been a persistent problem and one consequence is an acute regional discrepancy.

Figure 12: Gross Fixed Capital Formation (Proportion of GDP, OECD)



A convenient way to compare regional output and productivity is Gross Value Added (GVA), which abstracts the impact of tax and subsidies. As cited in the CSJ productivity report, using the then latest data from 2014, the UK's average GVA per head was £25,000, with London's at £44,000. While it is not uncommon for a capital city to have high productivity, the gap versus other parts of the country is vast. Of the 20 least productive local authorities in the UK, six are in the North West, three are in the North East, four are in Wales and three are in Scotland.

London's performance is helped by the financial sector, while for some regions low productivity can be linked to industrial decline. One of the least productive counties in the UK is Gwent Valleys (GVA per head of £14,000), the home to the now defunct Ebbw Vale Steel Iron and Coal company and Blaenavon Ironworks. For other regions, multiple factors are at play, mirroring the changing regional structure of the economy too, with an increasing share of output coming from London and other southern regions. The five most productive areas in the UK are in London.⁴³

It is also worth noting the imbalance that exists between the experiences of different firms in the UK; small versus large firms and those that are focused on exporting versus selling to the domestic market. According to the LSE Growth Commission, business lending in the UK is highly concentrated with six banks accounting for 70 per cent of lending to UK firms. The biggest challenge is the ability of small firms to attract growth finance. Their

43 See *The Great British Breakthrough: Driving Productivity Growth in the UK* (CSJ, 2017)

concern is tight credit supply to small firms could be a factor contributing to sluggish economic growth and a disappointing productivity performance. Indeed, the lack of lending to the small firm sector has been a perennial problem in the UK, first identified by the 1931 Macmillan Report into the role of the banking sector in the economy, and thereafter the gap between the funds that small firms needed and received was known as the “Macmillan Gap”.

This perennial problem may have been compounded by the regulatory environment since the 2008 global financial crisis, which appears to have incentivised banks to buy Government debt and to lend to the mortgage sector. The net effect of this combination would be to add to upward pressure on house prices – as low yields keep mortgage borrowing costs down and the ability to borrow adds to housing demand – and there has also been upward pressure on rents. Rising house prices also indirectly impact the issue of work, particularly in terms of the living wage needed to get by. It not only raises the amount needed to afford housing – as rental rates rise too – but also depresses the amount of discretionary income that is available to be spent on other areas apart from housing.

The UK’s large trade and current account deficit reinforce a number of factors – the need for the UK to attract inward capital flows (relying on the comfort of strangers is how the Governor of the Bank of England has described this), the importance of the UK either capping import growth (which is not always ideal as one way this may be achieved by tighter policy to dampen demand and a slower economy) or boosting export growth and this would be helped by a competitive exchange rate. While a weaker pound boosts competitiveness and is an important component of helping to rebalance the economy, it could come with a short-term cost, namely higher import price inflation, which feeds through into headline inflation and suppresses living standards if there is no compensating rise in wage growth. This, indeed, is the story of the period following the pound’s fall both after the global financial crisis and following the 2016 Referendum.

Inflation has risen in recent years, but now looks like it is decelerating, back towards the 2 per cent inflation target. Wage growth has been outstripped by inflation in the last two years – contributing to a real wage squeeze. But it is not just consumer price inflation, but the rising cost of housing that adds to the pressure for those on low incomes, as touched on above. While low interest rates have kept mortgage refinancing costs low, house prices have continued to rise, and with this, rental rates have continued to increase. The challenge for those on low incomes is to not only see work that rewards them with wage growth in excess of inflation (so real incomes rise) but also is sufficient to address the high cost of housing in the UK.

What are the growth sectors?

Where will future jobs come from? The UK Commission for Employment and Skills (UKCES) provides analysis on predicted future job growth in the UK economy. They project solid employment growth – over 2 million jobs – but variation across industry – over the period from 2014 to 2024.

Employment in primary and utilities was expected to be down 72,000 (2014–24) following a rise of 185,000 (in 2004–14). Manufacturing jobs would continue their decline, down 241,000 (2014–24). Construction would be up 301,000 (in 2004–14). Trade, accommodation and transport up 644,000 (2014–24) following a rise of 233,000 (in 2004–14). Business and other services were expected to be the biggest driver of jobs, adding 1.029 million (2014–24) following a rise of 1.769 million (in 2004–14) and 2.214 million in the decade before that. Public administration, education and health were expected to see job growth at a fraction of recent decades, adding 149,000 jobs in 2014–24.

Focusing on low paid sectors, we could see hollowing out of some areas, as the internet and online shopping impacts the retail sector. There is also expected to be a challenging time in areas such as secretarial and other administration, which could be displaced by ICT. Caring personal service occupations were the most rapidly growing occupational subgroup during 2004–14. It is expected to be the third most rapidly growing subgroup between 2014–24, behind customer service occupations and corporate managers and directors. Also UKCES notes that employment in “elementary occupations”, that requires little or no prior training, “have been in long-term trend decline for many years ” there have been some offsetting trends, citing growth of employment in call-centres and fast-food outlets, and it expected that there will be small increases in job numbers in this occupational area.

The key message from this diverging trend across sectors is the likely polarisation in demand for skills, with increased demand for high skills and for low skills, with a hollowing out in the middle. Skills will thus be a key driver in the future of work.

Preparing for the future

While the UK economy has considerable challenges, it has significant strengths too. This can be seen from the high rate of employment and the large numbers in work, and from the areas in which the UK has global expertise and strength, ranging from the cultural sector and creative areas, to leading universities, health care, pharmaceuticals, technology and finance, among others.

Government must focus on ensuring an enabling environment where the economy can compete and grow at a solid, sustainable rate and generate employment. However, while employment is at an all-time high, there is increased awareness of low pay and productivity. Employment policy will continue to play an important role in the future, and in doing so will have to confront such significant challenges.

Policy needs to position the UK to cope with globalisation and the other trends that have put pressure on low skilled and low paid employment. Another priority will be addressing the existing imbalances that exist in the UK economy and coping with – and positioning the economy for – future change, such as the impact of the fourth industrial revolution. Automation, the data and digital revolution will threaten jobs with repetitive or routine functions and impact those without the education and training needed for new roles. Specific interventions may also be needed. But Britain should never cease to be optimistic about the opportunities that these technologies present.

Policy must make sure we are prepared in the areas of the five “I’s” of infrastructure, investment, innovation, incentives and inclusive growth, ensuring no regions or groups are left behind. An important aspect of this will be to ensure that the right incentives are in place aimed at attracting investment that creates jobs and aimed at encouraging firms to invest more in their employees and for people to attain the skills necessary to compete.

Economic imbalances need to be addressed. The wrong interventions, however, could severely impact the future ability of the economy to create jobs and opportunities, especially for those at the bottom of the income spectrum.

chapter two

Key policy challenges for the future of work

Based on our analysis of the economic environment and labour market, the literature in this area (see Appendix A), and from widespread discussions with economists, policy makers, educators, social scientists, business leaders and workers across different sectors, we have arrived at eight key challenges for the future of work.

Of these challenges, we believe four demand urgent and detailed attention from policy makers if we are to offer a secure future to those on the margins of employment. Those first four issues, outlined here, will lead directly into subsequent papers and policy recommendations in our Future of Work programme: on regional imbalance, the rise of technology, changing skills needs and labour supply. The second four are important but not the focus of this work.

Paper 1: Continued regional imbalance and the future geography of jobs

While there is a clear gap between growth in London and parts of the South East and the North, as well as between cities with suburban and rural communities, the future geography of job creation suggests these imbalances could get worse. High value industries are disproportionately found in London and the South East. Data from the Office for National Statistics (ONS) show that London and the wider South East account for 56 per cent of the 1.3 million high value ICT jobs in the UK, and 40 per cent of the 3.2 million professional service sector jobs.⁴⁴ These industries are major growth areas for the British economy. Much as high value job growth is expected to occur disproportionately in London and the South East, automation is expected to have a profound impact in areas of the deindustrialised Midlands and North. The Centre for Cities data show the five cities that have the highest portion of jobs at risk from automation are Mansfield (29.4 per cent), Sunderland (29.2 per cent), Wakefield (29.2 per cent), Stoke (28.4 per cent) and Doncaster (26.5 per cent).⁴⁵

44 ONS, Workforce Jobs by Region and Industry [accessed via: www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/workforcejobsbyregionandindustryjobs05]

45 Centre for Cities, *Cities Outlook 2018* (January 2018)

The British economy is becoming increasingly dependent on urban centres to foster both job and economic growth. Such urbanisation has had a huge impact on the shape and dynamic of wealth creation across the UK. Just as deindustrialisation left an indelible mark on the UK employment landscape in the 1980's so urbanisation has the potential to do the same in the future. The CSJ's productivity report, *Great British Breakthrough*, found that

of the 20 most productive local authority districts in the UK, nine were boroughs based in London, and seven were in large regional cities across the UK (Milton Keynes, Manchester, Aberdeen, Edinburgh, Belfast, Glasgow, Oxford)... [and of] the ten most productive UK cities, not including London (Milton Keynes, Edinburgh, Aberdeen, Belfast, Glasgow, Oxford, Manchester, Bristol, Cambridge and Nottingham) have an average per head GVA 31 per cent higher (£33,459) than the UK average (£25,601).⁴⁶

The role of cities in the future of work will be important – even though the UK already has a high urban population, more people are likely to move to cities to find good work which will have implications for the areas they leave. Certain cities in the UK have struggled to generate economic growth in the aftermath of Britain's 20th century period of deindustrialisation. The UK is not immune to global trends, where the largest 600 cities will increasingly account for a larger proportion of global growth but the proportion of them that will be in the West will decline. London will be one of them but it is not clear if any other UK cities will make it into this large group.

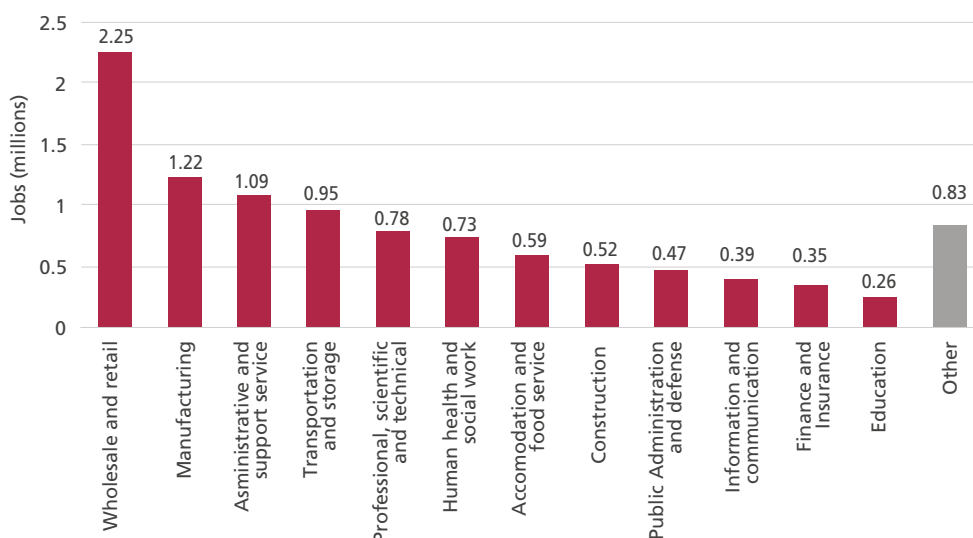
Many questions are likely to be raised. Getting the balance right between national priorities and devolving decisions and spending power to regional, or sub-regional bodies, where there will be full transparency and local democratic accountability, will be one of many policy issues. One aspect of the imbalanced UK economy is the extent to which London dominates, attracting young skilled workers from across the country. In our next paper we will explore the answers to this regional challenge and opportunity in full. There are huge variations of productivity across and within regions, with low paid, low skilled employment evident in many areas. Single economic and single community areas need to be identified, to create clusters and attract investment that leads to more and better paid jobs. The issue of greater regional variation in public sector pay needs to be addressed, given that in some regions this may crowd out private sector employment. Some regions may have full employment but the jobs may not be high skilled. What can be done to ensure clusters of growth become more prevalent? Procurement policies may need to be assessed on social value associated with public spending. Devolution of powers will need to tie in with local education and training, both creating an aspirational culture, but also ensuring local education provision delivers for local employers. Perhaps cities should not focus on building scale, but in some cases smaller may be successful. Enhanced connectivity is needed too – within and across regions – and this has to include public transport and broadband connectivity. In our next paper we will explore the answers to this regional challenge and opportunity in full.

46 Centre for Social Justice, *The Great British Breakthrough: Driving Productivity Growth in the UK* (2017)

Paper 2: Disruption caused by the 4th Industrial Revolution

In 1930 John Maynard Keynes predicted a cut to the standard working week to 15-hours by the end of the century. Why? Because our material needs would be met by an extremely efficient economic system of production that utilised technology and reduced the need for labour. There would, he felt, be widespread technological unemployment “*due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour*”.⁴⁷ While his timing may have been out, he touched on many important trends, some of which we are now witnessing. It is not just automation and robotics, but the digital and data revolution alongside artificial intelligence, that could transform the future of work. The consensus among academics is that automation will put at risk the jobs of between one-third to one-half of workers in the UK. Consultants PWC, for instance, estimate that 10.35 million jobs could be automated by 2030 – with most of these jobs in major employment industries such as retail and administration, as well as in manufacturing.

Figure 13: Jobs at risk of automation (m)



Source: PWC

Keynes’s prediction has not ceased to take hold of imaginations nine decades later. Western media outlets are prone to running headlines such as, ‘*Robots ‘could take 4m UK private sector jobs within 10 years’*’,⁴⁸ or ‘*The Long-Term Jobs Killer Is Not China. It’s Automation*’.⁴⁹ Technology is likely to create as many jobs as it ‘kills’. While Oxford economists Carl Frey and Michael Osborne predicted the loss of nearly one-third of British jobs, researchers at consultants Deloitte forecast four jobs created for every one lost to automation. The EU Commission, meanwhile, stated,

47 Keynes, J.M. *Economic possibilities for our grandchildren* (Yale University, 1930) [accessed via: www.econ.yale.edu/smith/econ116a/keynes1.pdf]

48 Booth, R. Robots ‘could take 4m UK private sector jobs within 10 years’ (Guardian.co.uk, September 2017) [accessed via: www.theguardian.com/technology/2017/sep/19/robots-could-take-4m-private-sector-jobs-within-10-years]

49 Cain Miller, C. *The Long-Term Jobs Killer Is Not China. It’s Automation* (New York Times, December 2016) [accessed via: www.nytimes.com/2016/12/21/upshot/the-long-term-jobs-killer-is-not-china-its-automation.html]

Automation is by no means a synonym for work extinction. Indeed, substitution may mean the destruction of certain jobs, but not the destruction of employment... the digital revolution has generated a surge in demand for new jobs and occupational categories that did not even exist a decade ago.

All of this may be captured by what we have called the four C's: Constant, Complex, Competitive and Complementary change.

Change will be constant, and thus we need to ensure people are prepared through skills, training and access to lifelong learning to embrace it. Change will be complex, and while the likelihood is that this will boost productivity, lowering costs, reducing prices and boosting output and demand, we will not be able to say where new roles will be created. The 3rd 'C' is the one that attracts attention – new technology and artificial intelligence will be competitive, undercutting those in repetitive and routine roles, and threatening and substituting for many middle and high-income jobs too. This could lead to disruption, displacement and near-term job losses. But it is the fourth 'C' that needs preparation for, as well. This is the complimentary roles – the new jobs – that will be created.

In an environment of potential dislocation and change, it will be necessary for effective social protection systems to be in place, to ensure labour market flexibility with access to lifelong learning, and the need to incentivise people and firms to retrain and acquire new skills. It will be necessary to help people cope with disruption and change, as jobs are replaced and new roles evolve.

Regardless of whether you take an optimistic or fatalistic perspective on the utility of technology – there is no doubt that it will play an increasing role in the means of production and provision of services and in how workers interact with each other, customers, and employers. Technology will play a greater and more significant role in the future of work, than it does today, and for that reason technological investment, data regulation, tech-skills and even what approach to take towards the taxation of autonomous machines must be addressed.

Paper 3: The changing demands for skills

The global economy, businesses and employers will demand new and different skills from workers in the future. However, there remains an ongoing demand from British firms for an education system that provides a high level of basic skill attainment. This will become an even more important issue for those in the bottom income deciles whose jobs face competitive pressure through either globalisation or automation.

As technology automates jobs, so mid-level technical skills (such as machine management) will become redundant and complementary tech skills (such as software programming and system monitoring) will become more in-demand. We are seeing evidence of how technology and automation is changing the demands of employers and structure of the workforce already. Historically organisations have had a small number of managers that look over a large number of mid-skilled associates, professionals and low-skilled tradesmen. As technology automates some of the mid-skilled and low skilled roles, the number of managers in an organisation outnumbers the mid and low skilled workers.

Technology and automation are not the only drivers of changing demands for skills. UKCES believes that

as the world of work becomes more flexible, employees are expected to shoulder more and more responsibility for skills development. Self-management, alongside core business skills, such as project management expertise, and the ability to promote your personal brand, will become increasingly vital. Personal agility and resilience, such as the ability to adapt to or embrace change is important within this context. Particularly for young people who will be competing for jobs with those that stay in employment longer.⁵⁰

These changing demands will have implications for how people choose to navigate their way through education and into employment. There is a growing sense that traditional academic education via Higher Education institutions do not always give graduates the skills that may be needed in the future. There are growing numbers of apprenticeships, apprenticeship degrees and non-graduate roles being offered at professional firms. Management consultancy firm PwC has seen a growing number of people apply for their school leaver and apprenticeship programme.⁵¹ But broadly speaking, policy makers must continue to look at strengthening the non-graduate route into employment. There is a clear link between technical qualifications at level 4 and high skilled job growth in a city (see below).

Figure 14: Relationship between NVQ4 + and High Skilled Job Growth



The UK needs to become a high wage, high productive economy. This points to the need for investment in skills. There needs to be an alignment of incentives, including tax, training and education policies to meet publicly stated skills goals. Spending on adult skills in the UK fell by 25 per cent between 2011/12 and 2015/16. In an environment of austerity, spending on areas that were not ring-fenced suffered. In an era of relative constraint for Government spending, decisions need to be made on the extent to which education is

⁵⁰ UKCES, *Future of Work: Jobs and Skills in 2030* (February 2014)

⁵¹ PwC, *More students choose apprenticeship route, as PwC sees applications rise* (August 2016) [accessed via: http://pwc.blogs.com/press_room/2016/08/more-students-choose-apprenticeship-route-as-pwc-sees-applications-rise.html]

a top priority for public investment in the future. But firms too, need to address their own needs. UK based firms have under-invested in UK staff over decades. In the future of work how adult skills and training are provided and financed will need to be addressed.

Paper 4: The supply of labour – population growth, immigration and an ageing workforce

The UK's growing population and workforce reinforces the need for a strategic, longer-term approach to employment policy.

The UK is set to become the most populous economy in Western Europe. If it solves its productivity problem it can become the biggest economy too. An increasing population reinforces the need to address the skills and education challenges. In 2016 the population of the UK was 65.6 million, its largest ever, and by 2030 the UK is due to surpass Germany's population and is then forecast to reach 74 million by 2039. High birth rates, longer life expectancies and a consistently high positive net migration figure have driven this figure.

Outside the EU, the UK will be able to determine its own migration policy. This may also force a change in business planning by firms, the full implications of which will depend upon the policy adopted. A decrease in the number of EU and EEA migrants coming to the UK could put short-term pressure on industries that have sustained themselves on cheap migrant labour; domestic personnel, food production, accommodation, food service industry, and agriculture. Business will need to be consulted as the new workable policies are adopted.

While there are pull factors – attracting workers to the UK – there are also push factors that the UK will need to be aware of, too. There are some very young parts of the world's population. This will reinforce the challenges facing low skilled workers in the UK, and other western economies, and also as education standards rise elsewhere, add to pressures for skilled workers too. A competitive external environment will reinforce the need for sufficient safety nets and skills training here at home.

The UK needs to have a migration policy that is fit for the future, and that takes into account business needs and access to skills and the wider economic and social impact that arises from large scale migration. The Migration Advisory Council, along with others, are already considering these issues. There is the need for managed immigration policy, allowing in skilled and unskilled workers. Options might include: a points-based system, although this may not be appropriate for the UK as the current countries that use it are trying to boost their skilled workers and also their small populations; a work permit system, which requires potential migrants to have an identified job and would be costlier and labour intensive to administer; an emergency brake; or adopting an evolved immigration policy though regional immigration controls.⁵²

52 See chapter 10 of 'Clean Brexit' by Liam Halligan and Gerard Lyons (Biteback publishers) for a discussion of future migration policy

There is also the reality of a rapidly ageing workforce. A Government report found that

the proportion of the working age population aged between 50 and the state pension age (SPA) will increase from 26 per cent in 2012 to 35 per cent in 2050 – an increase of approximately 8 million people.

The repercussions for policy will be huge – if the supply of labour grows faster than demand, it will suppress wages. Older workers have greater healthcare costs, may need disability related support in the office and are likely to need contractual terms that allow for time to seek healthcare (doctors' trips etc).

There is a perception that older workers are more likely to work in low skilled work, such as retail, admin and social care work, and are also less likely to be skilled in areas of technical skills (word processing, data management, CRM, video/audio technician etc). But this need not be the case. The EU Commission remarked that longer working lives will require a lifelong approach to skill attainment,

people will have to increasingly learn new skills to remain employable throughout their working life... For these reasons, training and reskilling will matter more throughout people's working lives. Education obtained before one's professional life will have to be regularly topped-up.⁵³

It is also reasonable to expect fewer older workers in physical roles (for instance in construction or engineering etc). The final impact this will likely have on the wider economy and Government policy will be the added cost of non-working people over-50 who are entitled to the State Pension. The State Pension costs £111 billion per year – an increase in the number of people above the SPA and claiming will have both implications for education and welfare spending and tax implications for businesses and individuals.

Other policy challenges

i) Driving wages up

Understanding the drivers of pay in Britain has become increasingly frustrating for policy makers. The rate of growth in median wages is one of the most important drivers in the economy and is vital for living standards. Over the last decade, real wages in the UK (wage growth after taking into account inflation) have hardly grown. Data from the Institute for Fiscal Studies (IFS) shows that wages have hardly risen for people at the bottom of the income scale in over 20 years (with only welfare support propping up income growth).⁵⁴ Now, inflation is decelerating, and wage growth is creeping higher, the combined impact of which will be a long-awaited boost for real wages.

The ability of the economy to generate higher wages was an integral part of the CSJ's 2017 report on productivity and so we will not revisit in this Future of Work programme. But wage growth depends on a combination of factors, often linked to the ability of the firm to pay. This is particularly relevant in the UK where the vast bulk of firms are small,

53 EU Commission, *The Future of Work: skills and Resilience for a World of Change* (European Political Strategy Centre, June 2016)

54 Belfield, C., Blundell, R., Cribb, J., Hood, A. and Joyce, R. Two decades of income inequality in Britain: the role of wages, household earnings and redistribution (IFS, 2017)

including micro firms with less than ten employees. Economic policies should not favour capital at the expense of employing workers and must also incentivise firms to upskill their own staff. The tax and regulatory environment needs to be as conducive as possible to allow small firms to compete. In turn, a consistent message from firms is for stability in government policy, so that they have time to become embedded.

ii) The need to safeguard workers' rights

The UK has been at the forefront of working rights legislation. There is every reason to expect this to remain the case. Some existing UK-derived rules on pay and labour conditions – such as the national minimum wage – have been set at home, others have been set at the European Council level, with UK influence. Now, post Brexit, with UK parliamentarians answerable to their electorates and with lawmaking made in Westminster, there is every scope for UK workers' rights to remain protective of those most vulnerable to exploitation in the labour force, as well as evolve with the changing future of work.

We must also ask what is the future role of pay bargaining and unions? Membership of unions has fallen by 53 per cent since 1979. There are 6.2 million employees in the UK who held a trade union membership, roughly 20 per cent of the workforce. In 1979 more than half the UK workforce had a trade union membership card. The factors that have driven declining trade union membership include the decline in manufacturing, public sector employment, changing perspectives of younger workers (union members are disproportionately older), and rule changes around industrial action (introduced in 2017).

iii) How changing business models could impact the future of work

The growth in casual employment could represent a trend change in types of business model. For instance, businesses are increasingly shifting from hiring a fixed workforce to having a more fluid one. The UK Commission for Employment and Skills (UKCES) believe that organisational structures will change with businesses becoming more flexible and networked. UKCES state that while volatility may drive growth in flexible work arrangements (such as zero-hour contracts), globalisation will drive elongated supply chains, and Generation Y values will drive increased transparency and employee engagement. UKCES also predict that location based and time-based work will become increasingly eroded as employees will be expected to work across global teams and across disciplines. That may be the case for those with transferable skills, but what about those in low income areas?

Finally, UKCES say

The hierarchical structures of companies are changing towards leaner management with more responsibility for tasks and processes. The responsibility to uphold the organisation's brand when dealing with customers rests more and more on the shoulders of individuals. New work modes like telework (work wherever and whenever) further drive this.⁵⁵

55 UKCES, Future of Work: Jobs and Skills in 2030 (February 2014)

The EU Commission have also written at length on changing corporate structures and role design:

Work is no longer a static concept but an umbrella term for roles performed in a different manner and under different legal arrangements. Tasks can be broken down and distributed even more widely through apps and online platforms.⁵⁶

iv) How the work demands of millennials impact the future of work?

The next generation of workers have grown up in the information era which has made communication and knowledge far more accessible. Younger generations are more aware of environmental and social sustainability which has forced companies to commit to sustainability goals. The United Nations now has seventeen Sustainable Development Goals, one of which, number eight, is “Decent work and economic growth.” Millennials may have different needs and issues that determine their choices. Psychologists have noted that millennials are more likely to invest in self-improvement. The effect this has on how millennials view work is hard to predict (even when you control for socio-economic background). However, it is becoming perceived theory that younger workers will change career more often and probably work across two or three jobs at a time.

The EU Commission states,

Millennials are keen to have more diversity and also more flexibility in their work patterns and commitments. They are reinventing the essence of economic exchange, professional fulfilment, and even consumption itself through the collaborative economy and a growing army of ‘prosumers’, with products and services being delivered on-demand and just-in-time.⁵⁷

Employers and policy makers will be expected to accommodate these demands of millennial workers – more flexible working arrangements, increased use of part-time contractors who work on individual projects, greater focus on environmental and social sustainability, as well as access to opportunities for advancement. Everything from job design to office design will be impacted. The cost of these adaptations will have to be met either through consumers, taxpayers or the individual, his or herself.

⁵⁶ EU Commission, *The Future of Work: skills and Resilience for a World of Change* (European Political Strategy Centre, June 2016)

⁵⁷ EU Commission, *The Future of Work: skills and Resilience for a World of Change* (European Political Strategy Centre, June 2016)

Conclusion

The CSJ, through its work, specialises in finding ways of improving the lives of the poorest and least advantaged in our society. Focusing on those towards the bottom of the income spectrum in the UK, the organisation was founded on the principle that work is the best route out of poverty. However, work is changing.

Our analysis here shows that the British labour market has changed significantly in the last 20 years. There are more people in work than at any time on record, driven partially by a growth in the number of women entering the workforce, the increase in the number of people working part time, people working far longer in to older age, and a large influx of workers from abroad. This far more diverse workforce is increasingly employed in the service sector, as manufacturing has continued to cut the number of workers it employs. Mobility between low paid low skilled jobs and high paid high skilled jobs is decreasing. And to compound a sense of precariousness in low skilled and low paid employment, businesses are increasingly using atypical contracts to hire staff, either in the form of zero hours contracts or agency contracts. This is part of what has become known as the gig economy.

These changes have partly been driven by greater pressures from globalisation, greater advances in technology and socio-economic shifts like urbanisation. These trends are unlikely to abate.

We have outlined eight issues that policy makers need to recognise and prepare for and, within those, the four which pose the biggest risk for the poorest workers and so will continue as the focus for this programme of work:

- I. Continued regional imbalance
- II. Growth of the 4th Industrial Revolution
- III. Changing skill needs
- IV. Changes to the supply of labour

These risks and opportunities are what face policy makers when considering the future of work. As we said at the beginning of this paper; *the aim of this research programme will be to answer the questions of how policy can support future high employment rates, good employment, wage growth and economic opportunity.*

In the following four papers for this research project we will focus on four distinct policy areas – Regional Policy, Technology Policy, Skills Policy, and Labour Supply. In each we will lay out a clear blueprint for employment policy, taking in to account these risks and opportunities, and the implications for people, for business and for policymakers.

Appendix: A flavour of the literature

There is a vast literature on The Future of Work and on the factors that influence it. Throughout the four major research reports that we plan to produce, we will be looking at, and referring to, some of this literature. Here, in order to provide a flavour of that, we outline some important reports and research papers from recent years. Deliberately this is not a comprehensive review, but a favour, in order to highlight and bring to life some of the key issues.

The UK labour market

ONS: *UK labour market*: April 2018 This is the latest monthly release from the ONS of the state of the UK labour market. It is always the best place to start, to get a feel for the trends over the last year and current developments. The UK employment story since the summer of 2011 has been a positive one with near consistent employment growth. The employment rate of 75.4 per cent is the highest on record, with 32.3 million in jobs. This translates into approximately 3 million more people in work over that period. The growth in employment since the Global Financial Crisis (GFC) has been driven by the private sector, an increase in female participation in the labour market, the number of self-employed people. However, wage growth has proved more of a problem. Using constant 2015 prices, (so allowing comparisons to be made over time) weekly pay now of £459 would be below the pre-GFC peak in March 2008 of £473. Likewise, with bonuses, weekly pay using 2015 prices would be £486 versus a pre-GFC peak of £522 in February 2008. The current average regular pay is £483 per week and total pay (including bonuses) is £513.

Resolution Foundation: *Work in Brexit Britain (2017)* This looks at the UK labour market in the near term, taking into account changes to minimum wage laws, labour relations and migration policy as a result of Brexit. The Resolution Foundation forecast a tipping point at the bottom of the labour market, caused by a significant decline in low skilled migrant labour, where tighter labour markets will put upward pressure on labour markets and reduce the amount of low paid work in Britain.

UK Government Independent Report: *Good work – the Taylor review of modern working practices (2017)* The culmination of an independent review into modern working practices within the British economy, led by RSA Chief Executive Matthew Taylor. The review recognised the UK labour market was on the whole flexible, with an appropriate level of employment protection and was functioning well with high

employment rates. Commissioners recommended the Government develops a means of measuring 'Good Work' in the economy, and looks at ensuring worker status applies to people in the gig-economy sector.

Royal Society of Arts (RSA): *Are British workers thriving, striving or just about surviving?* (2018) Authors at the RSA released a report looking at the problem of economic insecurity in the UK. Their survey with Populus polling agency found that while 71 per cent of workers find their job interesting, 70 per cent of workers believe their job makes good use of their skills, and 64 per cent of workers are satisfied with the sense of achievement from work, about 1 in 3 workers would classify themselves as economically insecure and 6 in 10 workers do not feel they have good opportunities to progress at work in future.

The future of work and skills

IPPR: *Technology, Globalisation and the Future of Work in Europe* (2015) Matthew Whittaker from the Resolution Foundation talks about what the current trends tell us about the future of the British labour market. Whittaker concludes that there will be a continued future increase in the labour supply, driven by tighter household finances pushing more women and older workers into work. He also points to increased growth of service sector representation in the labour market, which has helped contribute to stagnating real wages (as service sector income is redirected to capital owners and less to labour). Whittaker also points to the hollowing out mid-skilled employment in Britain, and rise of casual employment who are broadly found in the gig-economy.

Jesus College Cambridge and KPMG: *The Future of Work* (2016) Contributors to a conference held at Jesus College Cambridge, that was formalised in a report, spoke of both the changing dynamics of the British economy and changes to the way we work. Technology has allowed for more flexible working, increased productivity, and a growth in gig-economy related self-employment. They note that this is a historical precedent as the pre-industrial revolution economy was dominated by self-employed guild members.

UK Commission for Employment and Skills: *The Future of Work – Jobs and skills in 2030* (2017) UKCES develop a scenario-based analysis of what the British economy and labour market will look like in 2030. They identify 13 trends including; demographic change, growing diversity, growing income uncertainty, growing desire for work-life balance, changing work environments shaped by ICT, converging technologies and cross-disciplinary skills, digitisation of production, big data, changing economic perspectives, a shift to Asia, growing business ecosystems, growing scarcity of natural resources, and decreasing scope for political action. They go on to identify 10 key disruptions that could further impact the British economy; reverse migration, changing values of employees', where workers select employers on the basis of alignment with their own values, zero-hour contracts become the norm, anytime/anywhere skills delivery (via digital platform), AI and robots, de-globalisation, geographically alternative centres of excellence, the UK's leading position in key economic sectors is lost to high growth economies, disrupted Internet developments due to cybercrime, resource conflicts, and partial fragmentation of the EU. From there they develop four scenarios that include (a) business as usual scenario where increased flexibility leads to growth but increased income insecurity, (b) growth

in high-tech industries increases economic inequality, (c) automation leads to mass unemployment leading to increased political tension, and (d) High take-up of innovative technologies generates a productivity boost (at cost of increased insecurity for workers).

NESTA: *Future of Skills – Employment in 2030 (2017)* The authors state, “*The bottom line of our research: we can all stop agonising about machines taking our jobs*”. The report identifies 7 megatrends (technological change, globalisation, demographic change, environmental sustainability, urbanisation, increasing inequality, political uncertainty) and forecast that 20 per cent of workers are in jobs that will shrink while 10 per cent of workers are in jobs that will grow. They conclude by detailing the skills that will likely be in demand in the UK’s future; problem solving, originality, fluency of ideas, active learning, systems evaluation, deductive reasoning, systems analysis and monitoring. Importantly, the future UK economy will require both knowledge and skills but skills are increasingly in demand.

OECD: *Future of Work and Skills (2017)* Using trend (technological progress, demographic change, globalisation, value changes) analysis the OECD forecast just 9 per cent of jobs in the UK will be automated while a third will change in terms of skill requirements, organisation and experience. They prescribe 5 solutions: (i) ensure young people are prepared with the right skills for a technology-rich work environment, (ii) Ensure businesses capitalise on technology opportunities without off-loading financial risk on employees, (iii) reform social security to adapt to new types of work, (iv) strengthen activation frameworks to mitigate adjustment costs for people transitioning in to new roles, and (v) promote new forms of social dialogue which allow tailored solutions to new challenges to emerge at the firm-level.

Reskilling

UK Commission for Employment and Skills (UKCES): *Working Futures 2014–2024 Evidence Report 100, April 2016* Produced just before the Referendum, the results of this comprehensive assessment are likely to stand the test of time. It looks at employment prospects for the UK labour market over a ten year period, with a prime focus on the demand for skills. Sectoral change is identified as one of the key drivers of the changing demand for skills. Interestingly, among its findings is that “replacement needs” means that new job openings will be substantially higher than those just required by an expanding economy. They believe the proportion of the labour force remaining unqualified will represent only a small minority by 2024.

World Economic Forum: *White Paper – Accelerating Workforce Reskilling for the Fourth Industrial Revolution (2017)* An economies ability to manage the workforce through a Fourth Industrial Revolution depends on (a) market exposure (extent to which 4IR technology will be adopted) and (b) the capacity of the exiting adult workforce to adapt. Authors call for a radical rethink of adult learning, however point to low take-up of upskilling opportunities amongst those most at risk of losing their job, less educated low-income earners. The report looks at businesses and Governments that have put in place systems to support workers upskill and transition in to new high-quality jobs.

World Economic Forum: *Towards a Reskilling Revolution* (2018) A practical approach looking at how redundant workers in automated roles can be transitioned in to new roles either within their existing industry or into new industries and sectors. Authors estimate the eradication of 1.4 million US jobs and the creation of 12.4 million new jobs by 2026. By computing a similarity score, the report establishes new roles for redundant workers; computer programmers can become web developers, office administrators can work in sales, manufacturing employees can move in to construction. As AI and other technologies upend the primacy of human experience and expertise, individuals, policy makers and businesses must look to develop a workforce with skills that complement the work done by mechanical or algorithmic technologies. Transitions must satisfy three rules (i) target jobs are growing in number, (ii) new salaries are commensurate and (iii) they must be geographically suitable.

Technology

Robert C. Allen: *Engels' pause: Technical change, capital accumulation, and inequality in the british industrial revolution* (2008) In this paper in the *Explorations in Economic History*, there is a review of the data from the British economy between 1760 to 1913 showing a two stage evolution of inequality. In the first half of the 19th century, the real wage stagnated while output per worker expanded and profits rose. Then, after the middle of the 19th century, real wages grew in line with productivity. Technical progress was the prime mover behind the industrial revolution. Capital accumulation was a necessary complement. The surge in inequality was intrinsic to the growth process: technical change increased the demand for capital and raised the profit rate and capital's share. The rise in profits, in turn, sustained the industrial revolution by financing the necessary capital accumulation. After the middle of the 19th century, accumulation had caught up with the requirements of technology and wages rose in line with productivity. The pause in real wages, in the first phase, as the Governor of the Bank of England alluded to in a recent speech, was known as the "Engels' pause".⁵⁸

Osborne, M. and Frey, C.: *The Future of Employment* (2013) The pre-eminent paper analysing the number of jobs in the US and UK labour market that were at risk of computerisation (automation). Authors constructed an algorithm that looked at the probability of computerisation of 702 occupations and found that 47 per cent of total US employment is at risk of being automated. They also found a negative correlation between educational attainment and wages with the probability of an occupation being automated.

Deloitte: *Agiletown – the relentless march of technology and London's response* (2014) An area specific analysis of the effect of technology on jobs in London conducted in collaboration with Frey and Osborne of Oxford University. While London's labour market is less susceptible to the effects of automation, one in three London jobs are at risk. Authors noted particular concern that lower paid jobs are more likely to be automated, with jobs paying under £30,000 being eight times more likely of being lost than jobs paying over £100,000.

⁵⁸ See also slides from Governor Mark Carney speech in Canada, April 2018, www.bankofengland.co.uk/-/media/boe/files/speech/2018/slides-for-mark-carney-speech-at-public-policy-forum-toronto.pdf?la=en&hash=5F46D0A1D150B85A231ADA4DBCAE019B70302404

Deloitte: *From Brawn to Brains – The impact of technology on jobs in the UK (2015)* A retrospective analysis of the net effect of technology on the UK labour market between 2000 and 2015. They conclude that technology has contributed to the loss of over 800,000 lower-skilled jobs but has helped create 3.5 million new jobs. Each of these jobs pays on average £10,000 more than the low skilled job lost, adding £140 billion in to the UK's economy.

World Economic Forum: *The Future of Jobs – Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution (2016)* A survey of CEO's HR Directors and managers, representing more than 13 million employees across 9 broad industry sectors in 15 major developed and emerging economies and regional economic areas. 44 per cent felt Changing work environments and flexible working arrangements was the biggest socio-economic change currently being felt in the business world while mobile and cloud internet technology was the most significant technological trend. Authors call for business collaboration within industries to create larger pools of skilled talent, as will multi-sector skilling partnerships that leverage the very same collaborative models that underpin many of the technology-driven business changes underway today.

EU Commission: *The Future of Work: Skills and Resilience for a World of Change (2016)* A 2016 paper foresees the complete change in corporate architecture and role design. Whilst corporations and supply chains become more global, workers are expected to interact with teams from other continents, manage tasks as part of a wider international project, and co-ordinate the delivery of services or products across international boundaries. An individuals' role within this new process is becoming increasingly transient, meaning temporary positions will become more common, and whilst workers can expect more autonomy and flexibility they can also expect to work for many different companies in numerous industries and sectors over their working life.

McKinsey Global Institute: *Technology, Jobs and the Future of Work (2016)* McKinsey offer a global outlook on the labour market and the perceived effect of technology. One of the first anomalies they identify is the decline in income paid to workers over capital,

the decline is due in part to the growth of corporate profits as a share of national income, rising capital returns to technology investments, lower returns to labour from increased trade, rising rent incomes from home ownership, and increased depreciation on capital.

They also point to the problem of low skill attainment amongst young people. A McKinsey survey found 40 per cent of employers said lack of skills was the main reason for entry-level job vacancies and sixty per cent said that new graduates were not adequately prepared for the world of work. They go on to forecast 49 per cent of the world economy or 1.1 billion employees (and \$12.7 trillion in wages) were at risk of being affected by automation technologies. At the same time 20–30 per cent of workers in the UK and US are engaged in 'independent' (gig) work. Regardless of these downsides, they go on to say that embracing technology could add up to \$2.2 trillion to annual GDP in the USA by 2025.

PWC: *Will robots steal our jobs? The potential impact of automation on the UK and other major economies (2017)* Using new data and developing their own algorithm that determines the automatability of jobs within each industry, PWC estimate that 30

per cent of UK jobs (more than 10 million jobs) are at risk of automation. Those most at risk were workers with GCSE-level education or lower, and also working in high risk industries such as transportation and storage, manufacturing and retail.

Asian Development Bank (ADB): *Asian Development Outlook 2018: How Technology Affects Jobs (April 2018)* As part of their annual economic outlook, the ADB conducted a special report into how technology would impact Asia. Their conclusion was a positive one. As this was a practical report focused on many poor economies across Asia, the generic conclusions are worth noting, even for the UK, and may be relevant as we consider the impact of technology on those on low incomes. The report concluded that policymakers will have to be proactive if the benefits of new technologies are to be shared widely across workers and society. This will require coordinated action on skills development, labour regulation, social protection, and income redistribution. Significantly, new technologies can help deliver solutions in many of these areas. Adaptive learning technology, an educational method that uses computer algorithms designed to adjust to individual students, has enhanced learning outcomes in schools; governments should use and promote their adoption. Similarly, technological advances in biometric identification can improve how social protection programmes function by reducing costs, overcoming implementation challenges in sophisticated unemployment benefit systems, and enabling the tracking of job-placement services.

Place matters

Enrico Moretti: *The New Geography of Jobs (2013)* The US academic detailed the significant urbanisation of job growth since the 80s in America. He specifically notes the importance of high-tech highly educated jobs in high growth service sector industries as being a valuable commodity in a locality. For every high-tech job in software, social networking, or AI, 4 more jobs are created in 'support industries' such as legal, real estate, or entertainment. This is an extension of cluster theory, and Moretti goes on to describe how clusters form – largely an acceleration of activity driven by local higher education institutions, infrastructure (housing and transport), major employers and cool bars and restaurants that attract young millennials.

Centre for Cities: *Cities Outlook 2018 (2018)* Using data from the NESTA report '*The future of skills: employment in 2030*' establishes that cities in the North and Midlands where there are a higher proportion of jobs that are automatable (predominantly in manufacturing and low skilled service sector work) are most at risk of unemployment linked to automation.

Social Mobility Commission (2017): *State of the Nation 2017: Social Mobility in Great Britain* Chapter 5 of this report focuses on working lives, and concludes that, "The Home Counties in the South East and East of England perform best at this life stage, with residents benefiting from the clustering of high-skilled, high-paid jobs and levels of affluence leading to higher than average rates of home ownership." Rural and coastal areas do worst overall in this life stage as many are cut off from access to top jobs, with poor transport links resulting in travel-to-work times nearly four times those in urban areas. Two-thirds of high-skilled, knowledge-based jobs are located in cities, and in England one in three of these jobs is in London. But high housing costs and low pay

for many city residents mean that only 12 per cent of towns or cities make it into the top 20 per cent of social mobility hotspots in this life stage. Low pay is pervasive throughout the country, with more than 30 per cent of residents in 71 largely rural areas earning below the voluntary living wage. They say, central government should put social mobility and place at the heart of the industrial strategy, with a focus on rebalancing economic and work opportunities.

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