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The Future of Work in Wales

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Contents

Summary

- This report reviews the available evidence on the future of work in Wales; specifically, to identify important trends and future scenarios, the opportunities and challenges that these pose, and how the Welsh Government might wish to respond.
- It is clear that significant demographic, social, economic, technological and environmental shifts are underway that will lead to fundamental structural changes to the world of work; indeed, there is evidence to suggest that this may already be happening.
- The economic, environmental and demographic challenges that Wales faces are well documented. The impact of new technologies less so, although this has been the focus of much of the current public debate, which has centred on the potential for new technologies to displace current jobs, and to enable employers to create and access flexible and contingent labour pools, risking a rise in precarious and insecure jobs.
- How these forces will interact, and what this will mean for the long term, is uncertain. The scenarios for the UK as a whole sit between two extremes: on the one hand, projections of a continuing low skill and relatively low productivity economy with high levels of employment, and on the other a high skill and higher productivity economy, where technological, social and economic disruption may mean fewer jobs, and may require more government intervention in welfare, education and skills.
- The evidence reviewed points to the need for governments to focus on education and skills; fostering the development of transferable skills that are difficult to automate, such as creativity and critical thinking competencies, alongside skills for the digital economy, technical skills, and in STEM subjects. This focus must extend beyond the school system to ensure sufficient opportunities for lifelong learning, in-work training, retraining and progression. There would be value in reviewing the landscape of in-work training provision and progression opportunities in Wales.
- Our work has identified a number of other areas that Welsh Government might consider addressing. Of these, the immediate priorities would seem to be developing a broader definition of ‘good’ work and associated metrics to allow a richer understanding of the labour market in Wales; and exploring measures to address labour market inefficiencies.
- There would be value in further research on the implications of the trends explored here for the future of work in Wales. However, we would recommend that this is concentrated on specific sectors; particularly those where the trends intersect.

Introduction

In his speech to the 2016 Labour Party conference the First Minister of Wales called for a "deep and thorough investigation into the changing nature of work". To prepare the ground for this, we were asked to review the existing evidence base to explore what is known and is not yet known about the future of work in Wales. We have reviewed the available evidence on the changing nature of work; specifically, to identify important trends and future scenarios, the opportunities and challenges that these pose for Wales, and how the Welsh Government might wish to respond. In the process, we have also identified evidence gaps and areas where we believe that further research would be useful to Ministers.

A wide range of societal changes are affecting the labour market. Technological advances and increased connectivity; continued austerity and political uncertainty; demographic and climate change; shifting attitudes to working and more flexible patterns of employment; globalisation and urbanisation all impact on the nature of work. Concerns about the implications of a growing gig-economy, underemployment, a proliferation of zero-hour contracts and other non-traditional and insecure employment practices have grown. Simultaneously, swift technological advances among other disruptive social and economic shifts are generating speculation about an end to work as we know it. Given the scale and pace of change, it is likely that many children in primary school today will work in jobs that either do not exist today, or at least have constituent tasks that are very different from those of today. At the same time, the workforce of 2030 will largely be made up of the same people who are in the workforce today.

This report seeks to cut through these wide-ranging debates and speculation by reviewing the available evidence; beginning with the main drivers of change; considering the responses of employers and workers; and moving on to assess the possible implications for policy makers and in particular the Welsh Government.

Evidence of Change

There is no doubt that important demographic, economic, technological and environmental shifts are underway that will lead to structural changes to the world of work. This section concentrates on the existing evidence about how these drivers of change will affect the world of work in Wales. Much of the data and analysis is at the UK level, and it is important to note that these trends will be mediated by regional and local factors. These include social and community characteristics, such as a pre-existing industrial strategy or economic culture, the resultant skills base, the density of the population and its cultures, values and norms (Huggins & Thompson, 2014), and as a result their impact will vary between sectors and in different localities.

Technology

According to some commentators, the scope, scale and speed of current technological advances represents a Fourth Industrial Revolution. The digitisation and convergence of technologies is accelerating developments in artificial intelligence (AI) and machine learning; precision automation and next generation manufacturing; and more broadly in transport (autonomous vehicles), health and connectivity (Internet of Things). It is estimated that AI could add up to £654 billion to the UK economy by 2035 (Purdy & Daugherty, 2016). Ubiquitous and powerful digital devices are transforming how we communicate and access information, the capture, processing and application of which has been driving the development of technological processes that utilise this 'Big Data' to create new products and services. The pace, scope and scale of change means that technological developments and their impact on work are difficult to predict, but there is little doubt that they are disruptive force that will change, shift, destroy and create jobs (Degryse, 2016).

The automation of repetitive and predictable tasks is not new. What will be new is the range of tasks and sectors that will be affected by automation. Traditionally the main impact has been in manufacturing. In future services will also be transformed.

The number and type of jobs that are likely to be 'at risk' of automation is contested. Estimates for the UK range from nine to 35 per cent of jobs at risk (Deloitte, 2014; Haldane, 2015; Arntz et al., 2016; Chui et al., 2015; PwC, 2017). No robust Wales-level projections have been done[1], but early findings from the Arloesiadur project[2] suggest that approximately

[1] One figure that has been used in discussions in Wales suggests that 700,000 Welsh jobs could be at risk of automation by the early 2030s (Thorne, 2017). This is based on using Bank of England (Haldane, 2015) figures

a third of the Welsh workforce is employed in the least productive, lowest paid and most generic industries that are often considered at highest risk of automation. Most analyses suggest that people with lower qualifications living in poorer regions are likely to be disproportionately affected. Jobs in sectors such as transportation and storage (56 per cent), manufacturing (46 per cent) and wholesale and retail (44 per cent) are most at risk (PwC, 2017). Because these are generally semi-skilled and medium-paid jobs, there is a risk of job polarisation, where a lack of middle-skilled jobs can hamper progression opportunities and aggravate social and economic inequalities (OECD, 2017).

The compensation capacity of labour markets to respond to the displacement of labour by new technology is debated (Acemoglu and Restrepo, 2017; Mishel & Bivens, 2017), however it is generally agreed that tasks are much more likely to be impacted on by automation than whole occupations (Deloitte, 2015; World Economic Forum, 2016). By one estimate, 60 per cent of occupations could have 30 per cent or more of their constituent activities automated, indicating that automation is likely to change most occupations to some degree (Chui et al., 2015).

What is less well understood is the potential scale of job creation, or the impacts on job quality. A recent survey of manufacturers in Wales (Industry Wales 2016, unpublished) showed that large businesses are more likely to use automation and robotics in their manufacturing processes than small and medium sized businesses. While the per capita employment costs in large manufacturing businesses are 70 per cent higher, their Gross Value Added (GVA) per employee is 151 per cent higher. This might suggest that those businesses that are using new technologies (at the expense of some low-skilled jobs) tend to have a higher number of high-wage jobs, and are more productive than their peers.

Whether or not technological change leads to a substantial reduction in overall employment, it is a powerful disruptor that will impact labour market dynamics and will inevitably lead to new types of jobs and new forms of work that policy makers will be eager to understand and address.

Environment

Global environmental challenges include depleting natural resources, degradation of ecosystems and biodiversity, and climate change. These are exacerbated by population

for the probability of automation by occupation and applying these to Labour Force Survey figures for numbers of people employed in these sectors in Wales in 2010.

[2] The Arloesiadur project has developed an innovation directory for Wales. It is led by Nesta and supported by Welsh Government. For more information, see Mateos-Garcia, 2016 and Nesta, 2017.

growth, increasing global development and urbanisation, that drive demand for energy, goods and services. Scarce natural resources, higher extraction costs and the climate change imperative are already leading to changes in how power and materials are produced and consumed, and how cities and transport systems are being redesigned.

How governments and nations choose to act to address these challenges, both unilaterally and inter-governmentally, will affect all workplaces to some degree, and will shape future economic development. Welsh energy consumption is estimated at 100 TWh annually[3], however it is thought that improved energy efficiency could see total national energy use reduced to 60-65 TWh by 2035. Data suggest that Wales has the renewable energy potential to meet this projected energy demand entirely from renewable sources, which would result in an 80 per cent reduction in energy-related greenhouse gas (GHG) emissions (Wyn Jones, 2015). In 2015, 20 per cent of all electricity generated in Wales came from renewable sources; a figure that has tripled since 2007 (Welsh Government, 2017c). In relation to employment, the production of renewable energy can support more jobs per megawatt hour than energy produced from fossil fuels, and currently in the US solar power employs more people than oil, coal and gas combined (US Department of Energy, 2017; Geiling, 2017; Varinsky, 2017). The ambition to decarbonise Wales presents an important employment growth sector.

How national governments and the international community respond to climate change and environmental degradation will affect the shape of global economy, and the nature of work.

Economy

The impacts of globalised supply chains, cost-based competition and the 'long tail' of the 2008 financial crisis and are well documented in UK and Welsh economic indicators. Western economies are slowing and economic growth has shifted towards fast-developing countries in Asia, particularly China, and to some extent Sub-Saharan Africa. Factors contributing to UK economic weakness are thought to include reduced investment in capital and innovation and poor resource allocation (Barnett et al., 2014). Compared to other developed countries, the UK has a relatively high-employment, low-productivity economy, which has been dubbed the 'productivity puzzle'. In Wales this is more pronounced, lagging behind the UK average on most measures of economic performance. Gross Value Added per head for Wales is £18,002 which is 71 per cent of the UK average; the lowest of any

[3] This estimate does not include energy embedded in imports, food and energy consumption associated with most external travel e.g. fights

other UK region or country[4] and has been since 2001 (ONS, 2016). The employment rate in Wales is 71.2 per cent, ninth of the 12 UK regions and countries, while Gross Disposable Household Income per head for Wales was £16,341 in 2015, equivalent to 85.5 per cent of the UK average and again ninth of the 12 UK regions and countries. Currently, 23 per cent of all individuals in Wales live in poverty[5] and the child poverty rate has been persistently high compared to other parts of the UK (Welsh Government, 2017c). This rate is lower than in London and equal to the West Midlands, but is higher than the remaining UK regions and countries. Projecting to 2022, the IFS expects income inequality will grow across the UK, with the wealth gap between rich and poor and old and young widening (Hood & Waters, 2017) and a particular rise in child poverty. National income allocated to employee wages, known as labour's share, also appears to be reducing, where average UK real wages have been rising more slowly than productivity since 1990 (Haldane, 2015).

In Wales, manufacturing accounts for 10.7 per cent of all workforce jobs (UK 7.5), compared to 17.2 per cent in 1999 (UK 14.3). In Flintshire, an important manufacturing county, this figure was 26 per cent in 2011 (ONS, 2014). Nine thousand manufacturing jobs disappeared in Wales last year (Welsh Government, 2017a), and, of Welsh employers, those in manufacturing are most likely to be affected by skills gaps and least likely to have provided training over the past 12 months (Winterbotham et al., 2016).

There is an increase in Welsh employers in general reporting skill shortages, while under-utilisation of skills, a form of underemployment, is also widespread. There is an eight-percentage point gap in Wales between the proportions of graduate-level jobs and graduates in the workforce (UK three per cent) (Felstead et al., 2013a), meaning Wales has more graduates that it has graduate-level jobs. Of the UK regions and countries, Wales has the highest proportion of employed 'established' graduates (out of education for five years or more) working in non-graduate jobs; and is a net exporter of graduates (Clarke, 2017).

The public sector in Wales is a major employer – accounting for 27 per cent of the workforce – and spends £5.5bn a year on external goods and services. Austerity and reduced public spending has meant a real terms reduction in the Welsh Government's budget of eight per cent and reduced local government spend of 11.5 per cent (excluding health and education services) since 2010. Long-run impacts on public services are anticipated, yet Wales still spends 10 per cent (£920) more per head on public services than the UK average (HM

[4] Note that GVA per head is very strongly influenced by London and to a lesser extent by the South East, such that all other ten UK countries and regions have a GVA per head below the UK average.

[5] Poverty is defined as having an income below 60 per cent of UK median income.

Treasury, 2016). Wales also benefits from EU funds of approximately £680 million annually, the future of which are in question as the UK withdraws from the EU.

Secular stagnation and the productivity puzzle are aggravated by a mismatch between the supply of and demand for skills, and serious pressures on public finances. Together these present a volatile and uncertain future.

Demography and society

Growing, ageing and diversifying populations are the most significant social shifts globally. Population trends in Wales are well documented and overall life expectancies and 'healthy' life expectancies are increasing. Some 50-year projections suggest a potential rise in overall life expectancy of up to 15 per cent, though there are geographical variations with an eight-year difference between the most and least deprived parts of Wales and an 18-year difference in healthy life expectancy.

Wales' population has been projected to increase by around 5 per cent over the next 20 years (less than half the projected rate of growth for England). Half of this growth is attributed to natural change (births and deaths) and half due to in-migration (from UK and beyond) (ONS, 2015). These projections pre-date the referendum on the UK's membership of the EU and since around 40 per cent of inward migration to Wales by people from outside of the UK in 2011 was from EU countries, the rate of growth will be heavily influenced by the outcome of the negotiations over the UK's future relationship with the EU.

Over the next 20 years, the proportion of over 65-year olds in Wales is set to increase from around a fifth to around a quarter of the population, while the number of people aged under 16 is expected to remain stable at around 18 per cent of the population. In 2014 the Welsh old age dependency ratio (the number of working age adults compared to pensioners) was 2.8 (compared to the UK average 3.2). This is likely to remain stable until 2025 because of increases in the national retirement age. However, in the absence of further increases in the retirement age, the ratio is projected to drop to 2.3 (UK 2.7) by 2039 (ONS, 2015), putting intense pressure on tax revenues and public sector budgets.

By 2025 there could be 50,000 people aged 65 or over living with dementia in Wales, nearly a quarter of whom will be aged 90 or over. Meeting the demand for care of the elderly will require increased investment in health and social care and estimates suggest the Welsh social care budget will have to double to £2.3 billion by 2030 to match demand (Luchinskaya, 2016). This has significant implications for the future of work. A much larger social care workforce will be required, as well as innovation in the way care is delivered. But

the impact of an ageing population goes well beyond health and social care; it also has profound implications for the ways in which a wide range of industries deliver goods and services. It is likely to affect working patterns, with growing numbers of employees with multiple caring responsibilities seeking increased flexibility. Greater numbers of people working later in life may also present both challenges and opportunities, not only within the formal, paid-work economy, but in terms of their contributions to the informal, voluntary and unpaid economies.

An ageing workforce and the caring commitments of workers due to an ageing population will influence changes in working practices and necessitate growth in health and social care sectors. Questions around funding and the impacts of potential reduced inward migration present a pressing agenda.

Employment practices

The ways in which organisations have responded to economic slowdown and the emergence of new technology is influencing the world of work. The 2008 financial crash and the subsequent economic downturn prompted a shift in employment practices. Unemployment did not rise as expected and, instead, there was an increase in self-employment and part-time working (Patterson, 2012). The emergence of new technologies that enable the development of flexible, contingent labour pools has helped to reinforce this trend; although full-time, permanent contracts still account for the majority of employment across the UK (Taylor, 2017).

In Wales, the most recent data shows that almost two-thirds of workers (61.4 per cent) are considered to be in 'decent' employment; as defined in the Welsh Government's National Indicators, which measure the percentage of people in employment who are on permanent contracts (or on temporary contracts and not seeking permanent employment) and who earn more than two thirds of the UK median wage (Welsh Government, 2017c). Of the twelve UK countries and regions, Wales ranks tenth, by this measure.

Self-employment in Wales, in March 2017, accounted for 13.8 per cent of workforce jobs (UK 12.9 per cent), compared to 11.5 per cent in March 1999 (UK 11.1 per cent). Across the UK over 40 per cent of jobs growth since 2008 has been via self-employment (Bell, 2017) and the majority of business population growth since 2000 has been due to non-employing businesses, which accounted for 89 per cent of the overall increase.

At the end of 2015, 3.4 per cent of the Welsh workforce, 48,000 people, reported being employed on a zero hours contract in their main employment, the highest proportion of the

UK countries and regions after the South West of England (3.6 per cent; UK 2.3 per cent). Since then however, Wales has experienced the steepest reduction in zero hours employment, to 2.5 per cent of the workforce by December 2016 (UK 2.8 per cent) (ONS, 2017). Of people employed in this way across the UK, 33 per cent are aged 16-24 and 32 per cent overall would like to work more hours, compared to 9 per cent of other people in work (ONS, 2017). There are no reliable data on agency work or on the 'gig economy' but there is some evidence to suggest that it has increased across the UK over the last decade (Judge, 2016; Bell 2017).

Job tenure is a commonly-used proxy for employment stability, and has been rising across the workforce overall over the past two decades, once cyclical effects are controlled for. Research from the Resolution Foundation found however, that there are big differences between the genders and generations and there is evidence that a sizeable and growing minority are in precarious and insecure positions (Gregg & Gardiner, 2015). For older workers and particularly women the trend has been towards more secure and stable employment; the opposite is true among younger workers. Increasing tenure means people are staying in the same job longer, however this can mean declining job mobility and suggests implications for progression opportunities and pay.

The impact on those who work in these 'non-traditional' forms of employment is the subject of debate. There are estimated to be 700 different combinations of flexible work (Young, 2017) and over their working lives many people engage in a number of different roles, for various employers and sometimes multiple jobs simultaneously. A zero hours contract or agency work may be an ideal arrangement for a student requiring commitment-free work over the long summer break; picking up delivery jobs via an online app may be the perfect opportunity for someone with a day job to generate extra cash of an evening; while moving into self-employment is sometimes seen as a way for older and experienced workers to transition towards retirement.

Yet working flexibly can come at a cost. Research by the RSA shows that self-employment can offer people flexibility, more job satisfaction and lower tax rates, but it can also mean less security and lower pay (Dellot & Wallace-Stephens, 2017). The same research finds that the self-employed on the whole are nearly just as likely as employees to say they are satisfied with their income, yet fifty-four per cent of self-employed workers in the UK earn less than the Living Wage as calculated by the Living Wage Foundation (Wheatley, 2017).

Similarly, research suggests that workers on zero-hours contracts earn, on average, 6.6 per cent less than employees with similar characteristics doing similar jobs. A typical worker on a zero-hours contract, working 21 hours a week therefore earns £1,000 less a year than their

equivalent on a standard contract (Resolution Foundation, 2016). Separate research has sought to quantify the fiscal impact that this pay gap has had, estimating that since 2007 there has been a net loss to the public purse of over £5 billion a year[6] (Reed, 2017).

New technologies have facilitated the creation of flexible working practices, and there are examples of this offering genuine 'two way flexibility' where firms have used technology in innovative and inclusive ways to give workers greater control of their hours and place of work via digital platforms (Taylor, 2017). Such examples show how organisations that face peaks in demand, including in public services, might use contingent labour platforms as a positive alternative to traditional agency models (Hitchcock et al., 2017)

However, the degree of worker independence in some areas of the 'gig economy' (where work is allocated via online platforms) is contested. Ubiquitous smartphone use can create expectations that employees will be connected and available 24/7 to respond to shift allocations at late notice. The adoption of task monitoring systems allows employers to closely audit the productivity, speed and efficiency of workers, while algorithms and "co-bots" can be used to govern the way in which workers carry out tasks. Such forms of surveillance and micromanagement can erode the agency and autonomy of workers and place them under intense pressure, rendering these jobs unattractive and in some cases harmful to the wellbeing of workers. Examples of worker exploitation have led to calls for further work on the legal framework of employee rights and employer responsibilities; a topic on which the Taylor Review made a series of recommendations (Taylor, 2017).

Job security, worker autonomy, respect and fulfilment are reported to be among the principle factors of job quality and worker wellbeing. Work creates a sense of identity, self-worth and social meaning, and it has been traditionally observed that having a job is better than being unemployed for incomes, health and wellbeing (Layard, 2003). However, more recent discourse points to research around the detrimental health and wellbeing impacts caused by 'bad' jobs, precarious work and low pay. Low, irregular and insecure incomes and hours of work are a barrier to accessing pensions, mortgages, mobile phone contracts, childcare, certain state benefits and full employment rights. They make it difficult to plan families, caring responsibilities, holidays or save for the future and drive people to working long hours in multiple jobs. When managers control who works when, risk lies disproportionately with workers who as a result may feel obliged to work in poor conditions or when unwell so as to show willing in the hope of an offer of more hours, more pay or a permanent contract.

[6] This estimate takes in to account increased reliance on benefit payments and reduced tax and National Insurance revenue but does not include the cost of absence from work due to poor health caused or aggravated by poor quality jobs, the future cost of caring those who have failed to qualify for or earn sufficient amounts to contribute to a pension, or the opportunity cost of low skills utilisation.

Choice is a key factor. Those who can choose the most appropriate mode of working for their lifestyle and life-stage are privileged, but some people have no choice but to work in unconventional ways and, in so doing, compromise the safeguards of a guaranteed income, paid sick leave, pension and other standard employment rights.

While full-time, permanent contracts remain the dominant form of employment, economic pressures and technological developments have coincided to foster an increase in non-traditional working arrangements. New forms of flexible working have offered opportunities for some, but also aggravated existing inequalities in the availability of, and access to, 'good' work.

Policy Implications

Working on the basis of current and emergent trends, future work scenarios for the UK by 2030 diverge between, on the one hand, projections of a continuing low skill and relatively low productivity economy with high levels of employment, and on the other a high skill and higher productivity economy, where technological, social and economic disruption may mean fewer jobs, requiring more government intervention in welfare, education and skills (NEF, 2017; Lawrence, 2016; UKCES, 2014; PwC, 2014). The future is not pre-destined in this regard and political will and action will influence the outcomes for employers and employees alike. However, these two broad scenarios help to highlight a range of possible policy implications.

Employment law is not a devolved matter, and therefore we have not considered this area in detail. The UK Government commissioned the Taylor Review of Modern Working Practices (Taylor, 2017) to look at how to promote 'good work for all'. It made a series of recommendations about how the UK regulatory and tax system needs to adjust to reflect changing employment practices; including:

- Closing the gap between how self-employed and employed workers are treated by tax and benefits systems;
- Extending low-pay protection to self-employed workers who have their prices set by firms, including in the gig economy; and
- Regularly offering employees on zero-hours contracts or agency staff working regular hours for an organisation a contract to reflect those hours.

Education and skills

The UK Government's industrial strategy (HM Government, 2017) emphasises tackling regional economic disparities, particularly variations in productivity, and as a result, living standards. Educational attainment is widely considered the single most important determinant of productivity differences in the UK (CBI, 2017:17; HM Government, 2017, pp. 110). Key influences include early years education, the retention and attraction of graduates, and the provision and uptake of opportunities for skills progression and re-training, both as apprenticeships and throughout working lives. The introduction of universal public education following the industrial revolution is often cited as having been pivotal in alleviating the disruption caused by industrialisation and urbanisation; ultimately contributing to prosperity

(Schleicher & Wyckoff, 2017). Education and skills policy is therefore considered a fundamental lever in preparing populations of workers, in an inclusive and equal manner, and driving competitiveness in a global economy.

Future-proof skills

It is recognised that existing jobs may disappear before new ones emerge (Carney, 2016), so workers need to be prepared to have multiple jobs and careers with various employers. Non-cognitive attributes or "character skills" such as creativity and sensing emotions are difficult to automate and can give people significant comparative advantage over smart machines. As a result, skills frameworks and pedagogies that foster creativity and critical thinking, among other examples of "future work competencies", are gaining ground internationally as a means of building a resilient and adaptable workforce. Not only are these transferable skills among the top traits that major employers say they are currently seeking (Deloitte, 2015; World Economic Forum, 2016), but creative occupations (including artists, architects, web designers, IT specialists and public relations professionals) have been found to be most future-proof to new technologies (Bakhshi et al., 2015).

Creativity, critical thinking and digital skills in Welsh education

Creative young people is one of the headline purposes of the review underlying the Welsh programme of curriculum reform (Donaldson, 2015) and the Welsh Government, along with Arts Council Wales, has invested £20 million in 'Creative Learning through the Arts', a five-year programme for schools. Nevertheless, these skills are difficult to assess via standard examination and have often been under-researched. In response, a Welsh research team is currently participating in a programme of the Organisation for Economic Co-operation and Development (OECD) to develop a common language, pedagogical frameworks and assessments for creativity and critical thinking, with the expectation that these skills will soon be included in their international evaluation of education systems (PISA). Welsh schools are also being supported to embed digital competency into their teaching and learning through the national Digital Competence Framework.

While focusing on these transferable competencies is a sensible response to the uncertainties of the future labour market, a more concerted effort to promote ICT, coding and other digital and technical skills, as well as STEM subjects, has been called for in Wales, echoing international evidence (Thorne, 2017; Quintini & Wood, 2016).

Life-long learning

The scale and pace of change in the world of work is likely to outstrip the rate of change in the workforce – many of the current workforce will still be active in 2030, for example. This

means that upskilling, in-work development and retraining in these subjects throughout the life-course are just as important as school and degree programmes. Accordingly, the OECD's policy recommendations regarding the future of work, call for comprehensive skills strategies, focusing not only on building adequate skills, but promoting skills adaptation to allow workers to evolve with new requirements (Scarpetta, 2016).

Employment in 2030: Skills, Competencies & the Implications for Learning

New research from Nesta and Pearson finds that focussing on automation to categorise at risk or future-proof jobs ignores other contextual factors that paint a more complex and nuanced picture of the jobs landscape. They suggest that the future of most jobs is in fact uncertain and subject to change but that only between 10 and 20 per cent are likely to experience a significant rise or fall by 2030. This research is exploring evidence about the skills and competencies which will be required in the future economy. It recognises that most of the workforce in 2030 will be made up of people in today's workforce and therefore lifelong learning strategies will be an important consideration.

Research finds that people who engage with education and learning across the life course are more likely to remain in the labour market longer, are more productive and are better able to cope with change and multiple transitions (Barnes et al., 2016). Adult learning has also been found to indirectly improve the wellbeing of participants and lead to positive outcomes in physical and mental health, the educational achievement of their children and their children's health, and other socially positive attitudes and behaviours, including community involvement, social cohesion and integration (Schuller, 2017).

Based on this evidence, there could be value in **reviewing employability and careers support in Wales from pre-employment and employment entry to staying in work and progressing in work**; and particularly focusing on how **individuals are supported to develop, maintain and improve their learning and skills** throughout their working life.

The labour market

Inefficiencies in the functioning of the labour market can limit the potential for individuals to find quality work that fits their skills, and supports their development and progression. Sectors characterised by low-paid, low-skilled work are set to continue to grow. Employers in certain sectors struggle to find people with the right skills, while people struggle to find work that matches their potential.

Growth sectors

Economic, industrial and active labour market strategies look towards 'growth sectors', sometimes known as 'key sectors' or 'priority sectors' in designing their skills agenda. These may be defined according to several different criteria: sectors of strategic priority and/or those with high and growing GVA and/or employment. The Welsh Government has identified nine priority sectors that accounted for just over two thirds of businesses and 45 per cent of employment in Wales in 2016. Other analyses identify slightly different sectors (Green et al., 2017a; Owen, 2012) but among them are wholesale and retail trade; accommodation and food services; administrative and support services; professional, scientific and technical services; construction; social care; energy and environment; financial and professional services; creative industries; life sciences and tourism.

Jobs and working conditions vary between these sectors. Work in construction, professional, scientific and technical services and finance and insurance is associated with above average pay, while many jobs in accommodation and food services, wholesale and retail and social care are associated with below-average pay and in some cases fewer working hours (Bevan Foundation, 2016). For those in growth but low-pay sectors, enabling career progression is particularly important, however, a surplus of low skills and job polarisation makes progression challenging (OECD, 2017c). Evidence suggests that governments should work with partners to develop localised industrial strategies that have an explicit focus on job quality and progression (Green et al., 2017b).

Progression

Research into low pay and progression in the UK's labour market found that only 17 per cent of low-paid employees (earning below two-thirds of median hourly pay) made a sustained move onto higher wages over the course of the decade 2006 to 2016 (D'Arcy & Finch, 2017); suggesting that for most low-paid workers, poorly-paid positions are not acting as a stepping stone to better paid employment. Current UK labour market policy is predominantly directed at supporting pre-employment and employment entry but there is a lot less evidence about supporting people to stay and progress in work (Green et al., 2015). Evidence suggests that the suitability of the job to the person's circumstances (e.g. timing and location) is important for retention, therefore it can be worth allowing time to find the 'right' job rather than just 'any' job.

In-work progression can mean progressing to higher wages or to a more stable job and this may involve moving between employers. While in-work training may be desirable, employers in Wales are found to invest more in training their higher skilled and better paid workers,

therefore training opportunities may not exist for those lower down the pay-scale. Similar barriers exist in small businesses that may not have the space internally to promote staff (Sissons et al., 2016). Therefore further education institutions and other labour market intermediaries, rather than solely employers, are key to promoting worker transition and progression through the labour market. This may include work coaches tasked with supporting in-work benefits claimants to increase their earning, as is being trialled currently as a feature of Universal Credit and progression initiatives agreed as part of Welsh City Deals. A recent report into the future of work and skills in Scotland puts progression at the heart of its recommendations. From 'progression agreements' between learners, employers and skills providers; to a dedicated 'Progression Unit' to monitor improvement, the report recognises the importance of closing the 'progression gap' to achieve inclusive economic growth (Thomas & Gunson, 2017).

Labour mobility

At the 2017 Welsh Labour Party conference the First Minster voiced his ambition to make Wales "a fair work nation where everyone can access better jobs closer to home". Research by the Resolution Foundation finds a significant decline in the share of UK citizens moving region and employer since the turn of the millennium. It seems that people across the UK are finding jobs closer to home thanks to falling unemployment and narrowing regional disparities in employment rates. However, differences in regional productivity have increased, suggesting that workers are failing to find jobs locally that best suit their skills, leading to underemployment and labour market inefficiencies. The reduction in economically-driven internal migration is also associated with stagnant wage growth; the typical earner would have been £2,000 better off moving region and job compared to someone staying with the same employer. Nevertheless, while labour mobility is desirable, research finds that enabling effective job-matching is most important to underpin a policy of fair work and better jobs (Clarke, 2017).

The underutilisation of skills is estimated to represent a loss of between £12 billion and £25 billion to UK GDP. Perfectly matching skills to jobs across the workforce is unrealistic, but improving skill utilisation levels to those seen in countries like Germany and France would represent a boost of £5-9 billion to the UK (Holmes, 2017). There is an imperative therefore for high quality labour market information (LMI) and forecasting capability. The three Welsh Regional Skills Partnerships anticipate future skills needs by utilising secondary LMI data from Stats Wales, the Employer Skills Survey, UKCES Working Futures 2014-24 and reported demand for Welsh language skills to complement their own primary research.

Sources of LMI are however becoming more sophisticated. Nesta and Pearson, as part of the ONS Economic Statistics Centre of Excellence, are developing a tool using online job advertisement data to provide real-time LMI for career and workforce planning. The UK Department for Education also has an 'LMI for All' programme that brings together ONS and UKCES survey data with job vacancy data to provide information for organisations offering careers advice services.

Job-matching

Research shows that skill imbalances across economies can lead to lower earnings and job satisfaction for workers, poor productivity for employers and low economic growth for countries. The OECD notes a mismatch between the skills available in the UK workforce and the industries with the capacity to expand. The OECD Skills for Jobs Database provides evidence on skill shortages, surpluses and mismatches to help better align skill supply and demand. It is based on competences (skills, knowledge and abilities) rather than specific occupations and intends to help policy makers identify groups of workers who have abilities that are common and surplus to requirements. These can then be the target of training provision to upskill in shortage areas (OECD, 2017b).

The OECD has found that in general, skill shortages emerge primarily in social and creative skills as well as in STEM subjects, while routine non-cognitive skills are in oversupply. Good practice case studies recommend expanding opportunities to participate in adult learning, boosting the role of further education and better connecting and involving employers, industry representative bodies, trade unions and educational establishments in stimulating both demand for higher-level skills and training to meet this demand (OECD, 2017c).

The rationale for skills forecasting has shifted however, from detailed top-down planning of the labour force to informing labour market actors on changes to the labour market (Wilson et al, 2016). Local skills strategies therefore need to consider labour market demand as well as supply. In comparison to other European countries however, the UK spends little on interventions designed to increase demand for labour, and rather focusses its active labour market policy on improving the employability of people who are out of work. This often constitutes a relatively inexpensive job-search service and overlaps with welfare initiatives that compel unemployed people into available jobs as quickly as possible. There is less support for individuals to progress, develop or reorient their skills to better match available job opportunities and little demand-side activity designed to improve job quality (Berry, 2014).

Useful further research in this area would include **mapping the Welsh skills, employability and employment ecosystem to better understand the feasibility and process of**

supporting better jobs, closer to home. It would also be beneficial to **review the effectiveness of labour market demand-side policy and practice elsewhere aimed at increasing demand for graduate and high-skilled labour** and its impact on productivity. Wales has the highest levels of underemployment of graduates and negative net migration of graduates. Consider also engaging with the developers of **new and emergent LMI tools for job matching and career planning** and promoting their relevance to stakeholders.

Supporting good work should be woven through **economic, labour market, skills, welfare and industrial and innovation policy**. To this end, there could be value in **exploring the potential of new tax powers to incentivise good work practices** and Welsh Government **competence in working with social partners to enforce employment law.**

Measuring job quality and good work

Recognition of the broad social and economic benefits of good quality jobs is spreading. Providing good jobs and meaningful work is believed to support the types of worker behaviours and attitudes that can create high performing, innovative and more productive workplaces (Findlay et al., 2016; Rogers & Richmond, 2016). Therefore, rather than simply aiming for full-employment, governments across the UK and beyond are increasingly interested in quality or decent work.

The International Labour Organization (ILO), EU and OECD among others have produced frameworks and indices to understand, design and monitor job quality. The Scottish Fair Work Convention is using a definition of job quality that includes: respect; security; opportunity; fulfilment and effective voice. The Taylor Review recommended that the UK Government develop metrics for job quality that include, among other measures, “pay (both absolute and relative), voice, investment in skills, employee engagement and satisfaction” (Taylor, 2017, p.103). In Wales, the National Indicators measure ‘decent work’, which accounts for job security and wage levels. Given the distributional impacts of variable job quality, it is important to analyse the impact on specific groups (Jeffrey & Michaelson, 2015).

Measuring job quality and satisfaction can be complex. There are some distinctions in what is valued in a job across populations and communities and these can also change over time. The Skills and Employment survey found that for Welsh workers, job security was more important than it was for those elsewhere in the UK, while the ability to use one’s own initiative was regarded as less important. It also found that worker well-being, feelings of job security, attitudes to employment, commitment and gratitude to employers were all higher in Wales than elsewhere, but suggests that this may be a result of good quality work being

relatively scarce in Wales with workers having little scope to move to jobs of comparable quality (Felstead et al., 2013b).

The Well-being of Future Generations Act, both through its five ways of working and its seven well-being goals, provides a framework for developing an approach to improving job quality that maximise its contribution to the goals of a more prosperous, healthier and more equal Wales as well as the Global Sustainable Development Goals of no poverty, decent work and economic growth and reduced inequalities (Welsh Government, 2017c).

Fair Work commissions

In Spring 2017, a Fair Work Board was established by the Welsh Government in partnership with its social partners, Wales TUC and representative business bodies, to establish a commission to make Wales a 'Fair Work Nation'. The Scottish Fair Work Convention has been running since April 2015 and its definition of fair work includes determinants that are broader than the more commonly understood factors influencing job quality: respect; security; opportunity; fulfilment and effective voice. Its framework for delivering fair work recognises the potential role of a wide variety of stakeholders who possess different levers to achieve better work outcomes; from governments legislating and agencies regulating, to civil society campaigning and industry bodies incentivising good practice (Fair Work Convention, 2016).

It will be important to consider the centrality of the Welsh language to workers and workplaces. Two thirds of Welsh speakers in work speak Welsh at least sometimes with their work colleagues and a similar percentage speak Welsh with people outside their organisation in an official capacity (Welsh Government, 2015). The 2015 Employer Skills Survey noted that a shortage of spoken and written Welsh language skills was a problem in around a fifth of all skills gaps (UKCES, 2016a). Welsh speakers and learners alike should be provided with every opportunity to use the language of their choice in their working environments and the Welsh Government's ambition to reach a million Welsh speakers by 2050 will require the ongoing adoption and promotion of Welsh in all aspects of life and society (Welsh Government, 2017b).

The Fair Work Board is currently agreeing its framework for Fair Work in Wales, however Welsh Government and its social partners may wish to consider how to **define 'good' work for Wales, taking into account the Wellbeing of Future Generations Act and Welsh language policy**. Together, these developments should provide a basis on which to select appropriate indicators, establish an action plan and monitor progress to **understand the incidence, profile, drivers and barriers to good and bad work in Wales.** This may include for example:

- **analysis of low pay, job (in)security and progression across the Welsh working landscape;**
- **examination of the extent to which people in Wales cycle in and out of different and multiple forms of work; and**
- illustration of working trends by sector, geography, life stage and other characteristics to identify problem areas and the profile of inequalities.

There is also an evidence gap around the **profile of self-employment in Wales, including the role of the gig-economy**. It would be of interest to explore:

- the prevalence of **types of self-employment in Wales according to motivations income and security** (Dellot, 2014);
- the **opportunities associated with self-employment;** the **incidence and nature of the "dependent self-employed" (or "dependent contractors") in Wales**, that is individuals taking on self-employed roles where they are dependent on a single customer (aka employer) for work, and are being required to work on a self-employed basis for the customer (aka employer)'s contractual practices; and
- the **role of Welsh Government in establishing and supporting safeguards for the self-employed and parity with those in employment**.

Current research commissioned by Wales FSB looks to address some of these points.

Public services

The public sector can play an important role in helping to shape the future of work, not only as a policy maker, but also as an employer, standard setter and purchaser (Froy et al., 2012, pp.66). In Wales, the public sector employs 27 per cent of the 1.4 million workers (380,100), (UK 22 per cent) (Stats Wales, 2017), pays salaries on average 22 per cent higher than the private sector (UK average 12.3 per cent) (ASHE, 2016) and spends £5.5 billion per year on external goods and services.

Policy makers in Wales are able to lead by example by recognising living wage accreditation and other fair work practices in procurement processes and throughout their supply chains. The public sector is therefore well positioned to influence standards of fair work in other public, private and third sector organisations, but this does nevertheless require consistent political will (Findlay, 2017). Similarly, the way that policy makers choose to respond to the ageing public sector workforce could be influential in shaping attitudes and expectations throughout the economy.

The stakeholders of work are typically considered to be employers, employees, their representatives and government authorities; however, labour market intermediaries, grassroots movements and other organisations can play an influential role and governments should work to foster an enabling context in which they can operate.

Trade Unions

Between 1995 and 2015, the proportion of employees who are in a trade union has decreased by 9.1 percentage points in Wales (UK 7.7) yet trade union membership density remains highest than in any other UK region at 35.2 per cent. Likewise, 54.5 per cent of employees in Wales have a trade union presence in the workplace, again the highest in the UK. This is in part explained by high levels of public sector employment in Wales. Those working in the public sector, along with female employees, older employees, those with a degree or equivalent and those working in larger workplaces (with 50 or more staff) are more likely to be trade union members (BIS, 2016).

Research from 2004 survey data points to the net economic benefits of collective bargaining activities (Department of Trade and Industry, 2007), while the influence of trade unions in strategic decisions around employment and industrial policy is generally associated with higher levels of employment protection and employee voice on issues of job quality and in-work progression (Berry, 2014). A new programme of work by the OECD is considering how workers in insecure employment in particular can be represented through collective bargaining in the workplace.

Consideration should also be given to how workers in environments without a trade union presence can be supported; this includes younger workers and those working in the private sector in Wales, fifty percent of whom are employed in micro or small businesses (fewer than 50 staff). This is significant as employment in large enterprises (with 250 or more staff) is falling faster in Wales than the UK as a whole (Welsh Government, 2016).

Ownership, safeguarding, enabling and harnessing

As technology increasingly drives productivity, some have highlighted a risk that profits are increasingly retained by the owners of the technology and less likely to be passed on to workers through wage increases, also known as ‘labour’s share’ (Mishel, 2012; ILO 2015; Haldane, 2015; Dauth et al., 2017). Some have argued for a ‘robot tax’, to avoid concentrating the control and the wealth derived from new technologies among the few (Tarrnoff, 2017; Shiller, 2017). However, it is not clear how viable this would be in an

increasingly globalised economy. There is also a risk that any such tax acts as a barrier to the adoption of new technologies and associated productivity gains. Alternative approaches mooted to reshape how economic gains are distributed include state or cooperative models of ownership, giving communities a stake in new technologies (Srnicek & Williams 2015; New Economics Foundation 2017). Redistribution could fund public services, and, should it be untenable to maintain high levels of employment in the face of automation, contribute to a basic income or guaranteed social wage (Martinelli, 2017; Konczal, 2017; Painter & Thoung, 2015), or subsidise a shorter working week (Jericho, 2017; Green Party, 2017; Coote, 2014).

An important consideration regarding AI and robotic systems, beyond task and job displacement, is the broader ethical dilemmas posed by these machines. Dellot (2017) outlines current applications of technology that raise issues of accountability, discrimination, privacy, fairness and self-determination. International governance structures, responsible technology policies and regulators to identify and manage systemic risks emanating from technological change are among the safeguards proposed. However, the speed of change across all industries will likely render traditional approaches to regulation ineffective, if not counteractive. Therefore, organisations and regulators are beginning to innovate in this area with iterative approaches that encourage self-regulation and risk management, that work across sectors and within new business models (Mulgan, 2017b).

Two-way flexibility and workers organising

Technology can be used to monitor every action of workers, leading to the intensification of work and the erosion of autonomy in some industries, but it can also be used to overcome these issues and to take advantage of the possibility to work how, where and when you like. The New Economics Foundation is working with taxi drivers in Yorkshire, including former Uber drivers, to set up their own driver-owned app so they are in more control of their work, avoiding the excessive surveillance and insecurity that has entered the sector. They are also helping workers develop an 'App Workers Charter' which will outline a voluntary code of good practice that workers can organise around and to which responsible gig-economy employers can sign up. The Resolution Trust also outlines a series of examples of 'pro-labour innovations'; new approaches, primarily online, that seek to support workers (Kelly and Tomlinson, 2016). Some pool information and boost bargaining power within organisations; some seek to organise the self-employed; while others are piloting worker-friendly platforms and business-models in the gig economy.

It is notable that the attitudes of workers towards technology in the workplace are generally found to be positive. Recent surveys show that many are keen to embrace new technology and maximise its benefits in the workplace and believe that it has the potential to improve productivity. There remains a concern that new technology may threaten their jobs, although

an important contributing factor appears to be that few feel their employer gives them a say on how technology impacts their work (Welfare, 2016; Deloitte, 2017).

Awareness of the changing nature of work and need to safeguard against the unintended consequences of technological change is prudent, yet robotics and artificial intelligence have the potential to both drive productivity and transform the way we live and work. Harnessing advances in technology to address both economic and social challenges simultaneously presents opportunities for public sector innovation (Government Office for Science, 2017) and to spread benefits more widely (Mulgan 2017a).

There is little to suggest that technological developments will impact the future of work in Wales differently to the rest of the UK, however Welsh Government may be interested to undertake **analysis at a Wales-level of the social and economic adaptations that may be required in response to more radical projections of change, such as an overall reduction in employment, and the implications of introducing a basic income or a shorter working week.** Similarly, a **review of the various methods of estimating predicted job destruction and creation** could inform application of the best evidenced methodology to the Welsh economy and workforce. By building a profile of workers most at risk of job displacement and the sectors for potential employment growth, retraining and upskilling requirements can be identified to enable job matching. Finally, by **reviewing the technological advances and other trends** that are shaping modern industries, it should be possible to **assess Wales' readiness to harness the economic benefits**, taking into consideration global value chains and reshoring opportunities.

Conclusion

This report provides an overview of the issues and the current state of the evidence, exploring what we know and what we don't, about the future of work in Wales. This is an extremely broad subject with many interconnected strands that cut across multiple government agendas and stakeholders. The changing face of work has implications for education and welfare systems, employment law, economic development, health, tax and immigration policy, and is far reaching across the private sector, public services, voluntary sector and trades unions.

Employing new technologies - to improve decision making using real-time information, to facilitate communication and collaboration, to drive efficiency and to reduce repetitive or hazardous tasks – can benefit both workers and organisations. As technological developments increase productivity, they render skills redundant, at the expense of groups of workers, but how society uses new technologies is not a foregone conclusion. Political decisions, cultural norms and economic choices can alleviate social pain, rebalance power and control in the workplace, and facilitate labour market transitions towards 'good' work.

Good work does exist in the modern economy and many of the issues highlighted in this report and others are in fact enduring labour market inequalities that are being reshaped by digitalisation and other emerging factors (Halford et al., 2016). As working practices evolve it will be important to understand the impacts on disadvantaged and vulnerable groups. Policy should continue to work towards tackling persistent labour market inequalities and explore the possibilities presented by genuine two-way flexibility in the labour market, facilitated by technology, connectivity, good management and respect in the work place.

It is important to note that the degrees by which the drivers of and responses to change outlined in this report will impact on work in the future are contested. The scale of the unknowns associated with forecasting the future emphasises the need for a flexible, agile and resilient government programme. A workforce equipped with transferable and in-demand skills not only allows workers choice and agency over their careers but also adaptability in the face of anticipated but undefined job change, destruction and creation.

The implications of UK exit from the EU, with all its uncertainties, have not been discussed within the scope of this report, however restrictions to the free movement of people from EU states will impact the Welsh labour market and Welsh employers, as will access to the single market, funding for research and structural funds, particularly those supporting skills development, employment and economic development in Wales.

The prevailing uncertainty also highlights the complexity of the topic and the need for high quality research in this area to inform policy. The Work Foundation's Commission on Good Work is considering the themes of inclusive employment, growth sectors and competitive value chains in its series on a 'people-centred economy'. Relevant research is also underway at the Fabians' Changing Work Centre, the RSA's Future Work Centre, the Smith Institute and the IPPR Commission on Economic Justice, among other organisations and institutions, some of whom are referenced in this paper. Nevertheless, there are some areas where further work could help to inform how the Welsh Government and others might respond, particularly in the Welsh context. These evidence needs have been highlighted in the policy implications section of this report. Of these, we recommend that the focus in the short term should be on:

1. Developing a broader definition of, and associated metrics for, 'good' work for Wales, taking into account the Wellbeing of Future Generations Act and Welsh language policy;
2. Reviewing the landscape of support for in-work training and progression opportunities; and
3. Considering measures to support labour market information and job matching.

Rather than a single in-depth study into the future of work in Wales, we recommend developing a series of individual sector reviews to provide a focus for considering the impact of the changing nature of work in these areas, and possible responses to the same. The focus would be on the sectors that:

- Are most likely to be affected by the intersection of the trends identified (e.g. those where demographic change, technological advances, and a predominance of low-skill, low-wage jobs are likely to fundamentally reshape working practices); and
- Have the greatest impact on the Welsh economy and wellbeing or the potential for greatest impact, e.g. those that employ high numbers of people across Wales, in specific regions, or with protected characteristics overrepresented; or those sectors that align with the ambition for a productive and green economy.

A sectoral review could usefully map the likely direction of change, taking into consideration the following areas:

- Opportunities for skills development, in-work progression and lifelong learning
- Demand for high-level skills
- Investment in R&D, automation and associated opportunities and challenges
- Technology, governance and ethics

- Good work, two-way flexibility and employment law
- The role of the public sector and unions in influencing this sector

These reviews would benefit from being developed in partnership with industry, revisited and updated, and used to inform decisions among policy makers and stakeholders more broadly.

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