ESPAS *Ideas* Paper Series

ESPAS European Strategy and Policy Analysis System

Global Trends to 2030: The Future of Work and Workplaces

ESPAS European Strategy and Policy Analysis System

AN INTER-INSTITUTIONAL EU PROJECT

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Introduction

In some ways, the future of work is here; in others, it is shrouded in uncertainty or heralded with great expectations.

Of course, throughout human history, work has changed, as have societies. Transformations in **how** and **where** work is conducted, by **whom** it is performed and under **what** conditions, as well as how it is **remunerated** and **valued**, have come hand in hand with changes in individual and family life, social cohesion and well-being, and civic and political life.

Today, **a number of observed mega-trends are again shifting the tectonics of work**: Pervasive digital technology is opening up boundless new opportunities while at the same time blurring workplace boundaries and impacting human behaviours and expectations in ways that may still be unknown. Continuing population growth will create the biggest – but potentially most precarious and polarised – global workforce to date, with sustainability implications of an existential scale.

Some of these trends are in competition with one another, others are developing swiftly and intersecting in ways that we are just beginning to discern. Intertwined with the above, are trends with huge open ends: Automation may or may not create job vacuums, while co-working with sophisticated technology may be the boon and/or doom of future workforces. **These outcomes are not pre-determined, they will be shaped by the policies and choices we make.**

Given the many complex forces at play, linear predictions and conclusions may be simplistic, and no single policy intervention can serve as a panacea. However, for governments, citizens and businesses to be able to harness the opportunities and mitigate the risks ahead, it is necessary to monitor and understand the trends currently underway so that they can either **optimise** current institutions and policies, **redesign** them, or **innovate** them entirely.

This means asking ourselves a number of questions:

- How will these changes transform our well-being and affect our societal 'glue'?
- What does this imply in terms of how we govern our societies and what is needed for a renewed, effective and sustainable social contract to be forged?
- How can policymakers and the public sector respond to and anticipate these unprecedented challenges?
- How can education and training systems prepare citizens for jobs or professions that do not yet exist?
- What instruments and interventions can lead to more inclusive labour markets?

Against this backdrop, this paper highlights four of the most important trends that are impacting work and the workplace from the vantage point of Europe. It draws attention to intersections between trends that may merit further consideration, and highlights potential policy intervention.

Figure 1: Four Trends Shaping the Future of Work

Source: European Political Strategy Centre

PART 1. KEY TRENDS

TREND 1. Polarisation: advanced labour markets growing divided

Over the past three decades, **advanced economies have witnessed the hollowing out of the middle as regards jobs, incomes, skills, firms and regions**. These inter-related forms of polarisation are profoundly changing the nature of work and are impacting younger and older generations in different ways. The erosion of the middle has contributed to a trend of intensified social and political unrest in developed economies.

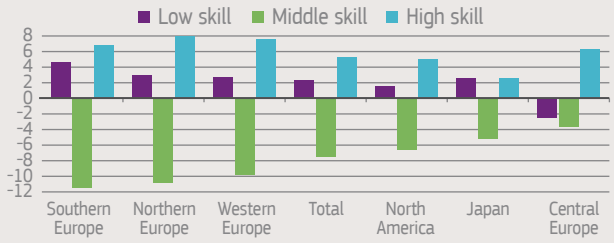
- **A U-shape distribution of jobs, skills, and wages**: Since the mid-1990s middle-skill standard jobs typically based on routine tasks (such as factory workers) have declined, while non-routine manual jobs (such as care workers) and abstract jobs (professionals) have seen a simultaneous rise (Figure 2). Not surprisingly, this pattern is linked to economic bounty flowing overwhelmingly to a small share of the population with stagnating wages at the bottom, translating into income polarisation.
- **'Superstar firms' and assortative matching**: A small number of firms with a low share of labour have surged ahead of their non-frontier counterparts in productivity, market-share and profits, and have come to dominate most sectors in terms of wealth and

influence through technological innovations, network effects and new business models. The phenomenon of 'assortative matching' has further contributed to existing disparities as high-skilled workers and high-wage firms have increasingly drifted together, with the same being true for low-skilled and low-wage companies (Figure 3).

- **Generational divides:** The evolution of job and firm-level polarisation has been most pronounced for the newest working generation, the millennials, and less so for their older counterparts. Long-time workers tend to be in more secure contracts established earlier in their careers, with accumulated benefits and protections that younger generations are less likely to have access to. Indeed, young workers are much more likely to be in temporary, part-time, or otherwise non-standard jobs that are associated with precariousness and diminished social protections such as paid leave, healthcare, retirement contributions, and disability insurance. As a result, the gap between generations in developed economies has widened significantly also in terms of risk of poverty (Figure 4).
- **Geographical cleavages:** The clustering of economic power and the process of agglomeration has accelerated the divide between urban centres and rural areas in terms of the productivity and availability of jobs. By 2050, over 66% the world's population is estimated to be urban.[1] Cities have always been the sites of most job creation, but superstar firms and startups have concentrated in a handful of cities or regions, further drawing talent to these locations and causing brain drain in others. Already, many of the biggest cities have GDP greater than mid-sized countries.[2] The same goes for the wealthiest regions. Rural areas, as well as lagging cities and regions, are emptying out, offering fewer and worse paid jobs. This in turn impacts a region's economic development potential, along with its capability to reform and innovate – a trend that is visible across many of Europe's regions (Figure 5).

Figure 2: Middle skills are on the decline

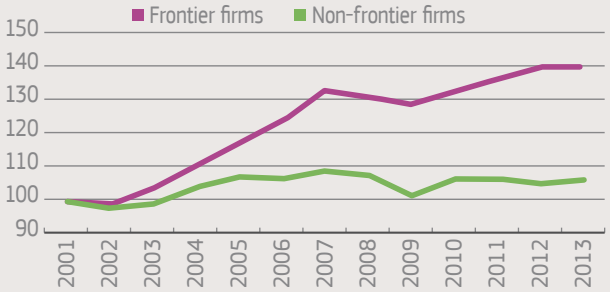
Percentage point change in share of total employment, 1995-2015



Source: Organisation for Economic Cooperation and Development

Figure 3: Frontier firms are surging ahead

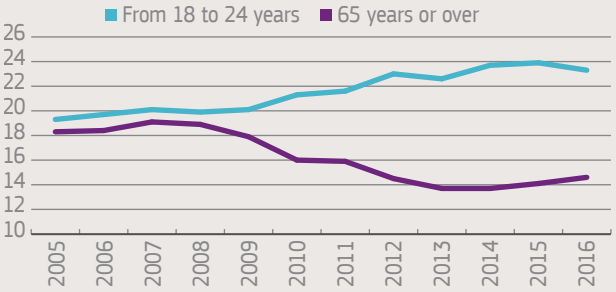
Labour productivity index, 2001=100



Source: Organisation for Economic Cooperation and Development

Figure 4: Young people are at greater risk

At risk of poverty rate, percent of total



Source: Eurostat

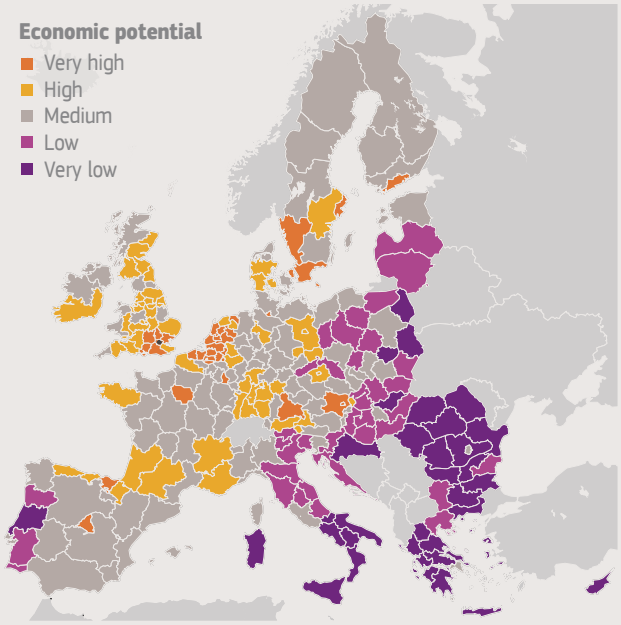
TREND 2. Blurred boundaries: benefits flow upwards, risks downwards

With the rise of digital and communications technology, the line between work and leisure is being blurred. Simultaneously and relatedly, there has been a rise of non-standard employment that challenges the former dichotomy between full-time work and unemployment. Depending on which end of the skills-spectrum workers find themselves, the outcomes of these developments can vary, with oppourtunities abounding at the higher end and risks increasingly accumulating at the low end.

One thing, however, applies to all: work as a type of **'social glue'** is changing. This may carry important implications for the future of social cohesion.

- **When work and life blend in:** Technological gains and changes to working culture have broken ground in facilitating connectivity and collaboration while simultaneously contributing to the erosion of boundaries between work and private life. In many high-skilled professional occupations, proximity to the workplace is no longer an absolute necessity, with a steadily growing share of employees able to do most of their work outside of the employers' location. For individuals, the preliminary outcomes of this are mixed. The use of ICT is correlated with higher levels of work autonomy and much valued flexibility. It is also associated with more work intensity and unpredictability.[3] At the lower-paid end of the spectrum, 'zero-hour' style contracts mean workers' time on and off the clock is in constant flux, and in some cases – such as in retail[4] – under algorithmic management.
- **The two worlds of non-standard work:** In the space between full-time employment and unemployment lies a growing segment of workers who are engaged in what is loosely referred to as 'non-standard' forms of work: temporary, part-time and on-call work, temporary agency work, and self-employment. While these workers remain a minority, in advanced economies, close to 60% of all employment growth since the 1990s has been in the form of non-standard work.[5] For those in high-paying jobs with sought-after specialist knowledge, untethering from an employer and hiring out their skills to the highest bidder can be a liberating boon. But for people without those skills, a more fragmented relationship with employers and co-workers translates into diminished bargaining power and limited access to social protections such as pensions, sick pay, and anti-discrimination policies. About 60% of working poor households in OECD countries rely primarily on non-standard work.[6] Against this backdrop, **social partners** face an uphill challenge: a workforce that can be easily outsourced and tends to experience greater churn is more difficult to organise. **Companies** too may end up losing ground: Just as some companies 'under-invest' in employees who are in temporary or part-time contracts, in terms of access to benefits and training, studies suggest that contractors likewise 'under-invest' in such companies, with knock-on effects for **innovation** and customer service.[7]
- **The impacts of bowling and working alone:**[8] Interactions between people at the workplace have always contributed to building a '**social glue**' between communities, particularly in integrating migrants, overcoming social isolation, and stimulating political and civic participation. With the rise of a more digitally connected yet physically and contractually fragmented workforce, how these crucial interactions will be sustained and what effects this may have on societal dynamics and **social mobility is an open-ended question.**

Figure 5: Some regions are falling behind



Note: The Economic Potential Index looks at endownments such as population density, market access, education, sectorial structure and investment.

Source: World Bank

TREND 3. The dormant challenges of an expanding global workforce

Although the labour forces of numerous advanced economies are slated to age and contract, in coming years, the *global* labour force will be doing the opposite (Figure 6). Africa's working age population is booming, and similarly, the Indian workforce adds 12 million workers each year.[9] Global unemployment rates have been rising, driven by emerging and developing economies where the pace of labour force growth outstrips employment creation.[10]

- **Growing workforces and rising automation: a perfect storm?** Traditional development models pitch manufacturing productivity as the ladder to progress for low-income countries – but with the rise of automation, might that ladder be pulled out from under the world's largest workforces? What could be the consequences if unemployment continues to rise in developing economies, particularly when automation is poised to hit these hardest? While automation estimates vary widely (Table 1), researchers agree that developing countries face a heightened risk. One study anticipates, for example, that 69% and 85% of jobs in India and Ethiopia respectively are at high risk of automation.[11] Without having had the time or resources to develop fully-fledged social safety nets, workers in low-income countries face a potentially unprecedented challenge.

- **The sustainability balancing act:** Meanwhile, if the next wave of automation is in fact accompanied by job creation large enough to accommodate the growing workforces of developing nations, another question emerges: can environmental systems sustain the bulge in consumption? At present, the richest countries emit more than 15 tonnes of CO_2 per capita, while poorer countries emit less than 0.1 tonnes per person – a more than 100-fold difference (Figure 7). If development means going down a similar consumption path, it is not sustainable at a global scale. Radically innovative thinking is required for emerging economies to build sustainable infrastructure so as to avert catastrophic climate and ecosystem collapse, and create decent jobs for humanity's largest global workforce to date.[12] This constitutes a critical opportunity for global collaboration and shared responsibility between developed and developing economies and those in transition.
- **Migration in the digital age:** Over the past three decades, human mobility has become more intense, more disorderly and, in many instances, more precarious. Disruptions in the labour markets of high income economies have generated cultural and economic anxiety, and while migrant workers risk seeing many of their jobs disappear due to technological advances, they are also blamed for precipitating lower labour standards by accepting less attractive employment. As digital transformation unfolds further, will this lead to countries taking fewer migrants? Or will only highly-educated migrants be sought after? Given that environmental, socio-economic and demographic conditions are likely to continue impelling emigration from certain parts of the world, how will these trends intersect with changes in the labour markets and in societies as digital transformation proceeds?

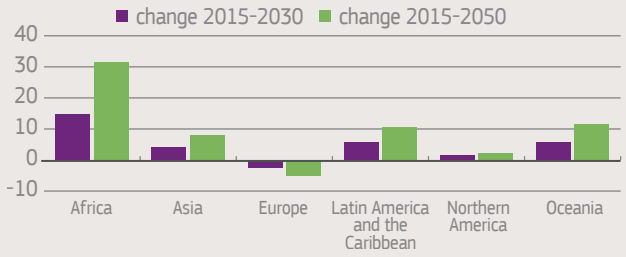
TREND 4. Shifting well-being and work: the good, the bad and the ugly

Well-being and work are intricately connected, and many countries have come a long way in establishing high standards in both. However, recent health and lifestyle trends point to an urgent need to connect new dots in order to avoid a work-related deterioration in well-being. Simultaneously, at a global scale there has been growing pressure to address poor working conditions and practices that are in violation of fundamental human rights.

- **Safer and more inclusive workplaces:** Work in industrialised economies has, over time, become safer with the introduction of health and safety legislation and public policies that have raised life expectancy,[13] literacy, and substantially levelled the workplace playing field for men and women.[14] Recent interventions have been aimed work-life balance, people empowerment, diversity, non-discrimination and inclusion, job design and support at work. What further incentives may be required to keep workplaces healthy and inclusive while providing the support that people with caring responsibilities need?
- **The side-effects of modern work:** The rise of chronic, stress-related diseases such as diabetes, cardiovascular diseases, drug dependency, depression, anxiety, and loneliness is often connected to 'lifestyle choices'. However, growing research suggests that these creeping epidemics – which now account for 75% of the disease burden in countries like the US – are tied to the increasing pressures of the workplace.[15] **As western workplaces have shifted from production lines to office chairs, and the accompanying tools of the trade have gone digital, many of the adverse impacts on well-being have simultaneously been**

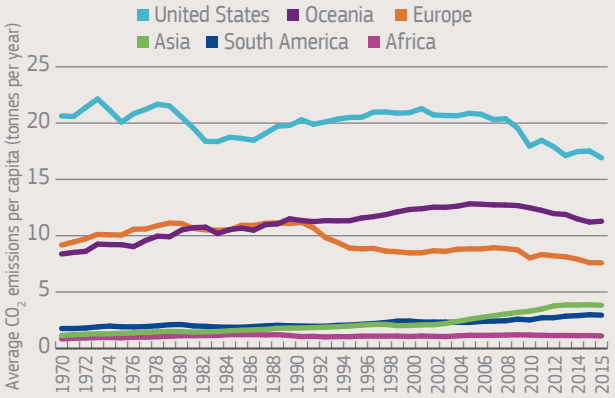
Figure 6: The size of the labour force is growing globally but shrinking in Europe

% change in the working-age (15-64) population



Source: EPSC based on United Nations (2017) World Population Prospects: The 2017 Revision

Figure 7: What if the carbon footprint of developing economies catches up with advanced economies?



Source: Our World in Data

individualised and unnoticed. Alongside great leaps forward in ICT, many workers today are 'never turned off' leading to attempts to grant workers '**the right to disconnect'**[16] from engaging in work-related electronic communications outside working hours. Work clashes with leisure through mobile devices and zero-hour contracts, while long hours impact on family lives and caring responsibilities, with some couples operating in systems of 'shift parenting'.[17] In addition, contrary to the assumption that 'any job is better than no job', the importance of decent, rewarding work and the consequences of poor quality work have been evidenced.[18] The implications for the future of work may develop as a Catch-22: the work we do now, and the way we do it, may impair our abilities to do the work of the future. Initial **forecasts indicate that future work will require creativity, human-to-human interaction, and a deep level of cognitive engagement.** But some of the most prevalent health issues we see arising today – stress, anxiety, depression, and other mental health problems – might directly impact our ability to cultivate exactly those skills which we will need tomorrow.

- **Working conditions vary along global value chains:** International market deepening has been characterised by an outsourcing of production from high-wage economies, which are responsible for high-value activities (conception, design and branding of products), to low-wage economies whose initial competitive advantage lies in the low cost of labour and the looseness of regulatory and legal frameworks protecting workers.[19] Incidents like the Rana Plaza factory collapse in Bangladesh, which resulted in the death of over one thousand workers, are emblematic of the challenges for industrial, employment and development policies raised by the international division of labour. Looking ahead, how low-income countries will be able to improve their working conditions in the face of competition not just from other low-income countries, but also from robotics in high-income countries, may become an even greater challenge as the spread of new technology renders labour costs less relevant to production and could result in a reshoring of global production back to industrialised economies.[20]

PART 2. UNCERTAINTIES, RISKS and OPPORTUNITIES

1. Co-working with sophisticated technology: a new paradigm?

Cutting-edge technology is swiftly entering the workplace, with profound implications for the way people are hired, fired, and the type of work they do. On the bright side, co-working with nascent technologies such as augmented reality (AR) and artificial intelligence (AI) has the potential to **unlock skills and possibilities that currently do not exist**. Overlaying digital data onto the real world via AR, for example, can help break workers free from the constraints of location.[21] In such a world, a doctor based in Brussels could perform a remote surgery in Somalia. AR could also help professionals carrying out unpredictable and highly dangerous tasks – like rescue missions or natural disaster interventions – become more efficient at a lower risk.

On the flip side, AI and big data also hold the potential to seriously **aggravate power asymmetries and biases** in the workplace. Emerging technologies may lead to unintended or unknown workplace dynamics and, coupled with inadvertent AI-facilitated discrimination, they could challenge the very fundamentals of our societies.[22] 'Workforce analytics' are already emerging as a way to screen employees through AI and preliminary research shows that, contrary to popular opinion, the data and algorithms used are rarely neutral. In fact, outcomes often replicate the very same biases that society has been purposefully trying to root out with anti-discrimination laws for decades.[23] Meanwhile in the workplace, companies are adopting new surveillance capabilities that allow management to oversee, monitor and assess the work of their employees constantly and in potentially invasive ways.[24] Sophisticated automated software can be used to grasp sentiment in the text of e-mails and attach a 'productivity risk' to employees who are deemed to be likely to leave the company, or capture information from every task performed by the employees on their computer or phone, aggregate it and then send warning messages to employees who deviate from the norm. Many employees who use a company computer or mobile are already subject to this type of monitoring, ranking and assessment, and most are unaware of it. Furthermore, employers have already issued about 202 million wearable tracking devices in 2016 alone, with that figure projected to grow to 500 million by 2021.[25]

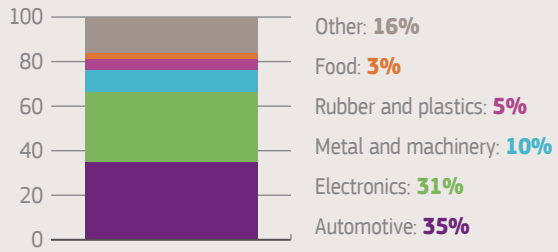
At the same time, smart materials, AI technology, and robotics mean **features that used to be uniquely human** – such as sensing, interacting, problem solving, learning, and even being creative – **can be captured by contemporary algorithms**. The impact on human behaviours, the potential social and cultural changes, and the complex legal and ethical issues that arise with regards to safety, privacy, responsibility, consent and human dignity in the workplace and society at large are still unchartered territory.

2. The societal impact of automation

The automation of production is accelerating around the world (Figure 9) as a host of emerging technologies automate physical tasks (robotics), intellectual tasks (cognitive computing), and customer service tasks (from call centres to supermarket scanners).

Figure 9: Robots are permeating many industries

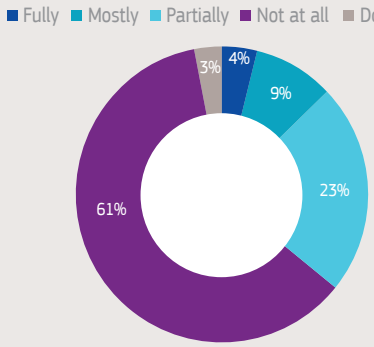
% of total industrial robots



Source: International Federation of Robotics , 2017

Figure 10: Most Europeans don't see automation as a threat

'Do you think your current job could be done by a robot?', %



Source: Eurobarometer

Predictions about the jobs and tasks that will be replaced or created through technological change vary widely (Table 1), and context matters: different economies will likely be impacted in different ways. Initial estimates indicate that automation will disrupt emerging economies to a great extent, for example. And the impact may be even larger when robots infiltrate the apparel and food processing industries, which currently employ over 30 percent of Asia's factory workers.[26] As regards public opinion, perspectives on automation differ even more. While surveys among Europeans suggest that 85% of respondents consider robots can do jobs that are too hard or too dangerous for people, and over 70% consider robots to be a good thing for society because they help people, at the very same time, seven out of ten believe that robots steal people's jobs.[27] Though interestingly, this assessment seems to apply to other people's jobs, and not their own (see Figure 10).

Prior technological revolutions suggest that while transitions may be challenging in the short to medium-term,[28] over time, novel jobs and occupations and entire new econonic sectors can create demand for workers and smooth labour markets.

The major policy challenges are to ensure that workers have the skills, protection and support needed to transition to new jobs and to new ways of working. Yet governments around the world are currently in responsive mode, with few tools at their disposal that enable them to be proactive about the impact of digital transformation on individuals, on social institutions, and on governance itself.

Table 1: Everything you wanted to know about who predicts what on the impact of automation

	Perspective 1 **Bid your job farewell**	Perspective 2 **Keep calm and carry on (but do keep an eye on inequality)**	Perspective 3 **Few occupations will be entirely automated, but all jobs will be affected**	Perspective 4 **The rise of the industrial robots**
Scope & background	In their ground-breaking study, Frey and Osborne (2013)[29] were among the first to gauge the **probability of computerisation for 702 occupations in the US labour market** arguing that the potential scope of automation is vast.	The OECD (2018)[30] shifted **attention to the variation between jobs of the same name and assessed which tasks are difficult for computers to carry out**, even in jobs that are most susceptible to automation.	Focusing on the years 2016-2030, McKinsey Global Institute (2017)[31] **used data from 46 countries to break down 800 occupations into more than 2,000 activities.** Based on this breakdown, they determined the capabilities that would be needed by workers or machines for each activity.	Acemoglu and Restrepo (2017)[32] and Bruegel (2018)[33] respectively evaluate **the specific impact of industrial robots on the US economy and on 6 EU countries** that make up 85.5% of the EU industrial robots market.
Their assessment on the impact of automation	**47% of total US employment is at risk.** In the first wave, most workers in transportation and logistics occupations, together with the bulk of office and administrative support workers and production occupations are likely to be substituted.	**14% of jobs in OECD countries are highly automatable** – equating to around 66 million job losses. Occupations with the highest risk typically require basic or low levels of education, potentially furthering labour market polarisation and inequality.	**While less than 5% of occupations consist of activities that can be fully automated, up to 30% of hours worked globally could be automated by 2030.** Physical activities are most susceptible.	**One additional robot per thousand workers reduces the employment rate by 0.16-0.20 percentage points in Europe.** This notable displacement would most impact young cohorts, middle-education workers, and men.

Source: European Political Strategy Centre

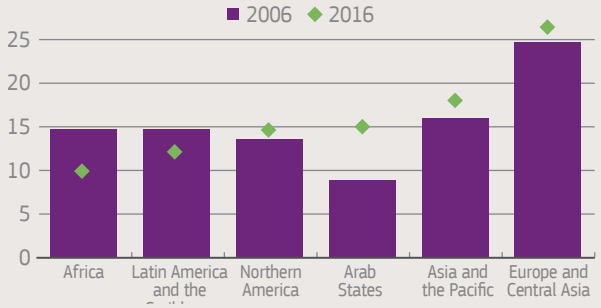
PART 3. IMPACT on Europe

1. Democracy in the balance: is polarisation upending politics as usual?

Beyond their socio-economic dimensions, polarisation trends in the labour markets of liberal democracies today are posing new political challenges. A rising number of people feel as though working hard will get them nowhere (Figure 11). Indeed, falling or stagnant incomes, precarious jobs, instability and scarcity of opportunities for the young, and persistent unemployment or underemployment have been the emerging reality for many. In many developed economies, citizens are losing trust in existing economic and political structures, while cohesion and confidence between communities is being damaged.

Figure 11: People increasingly don't think work pays off

Share of respondents who think people cannot get ahead by working hard



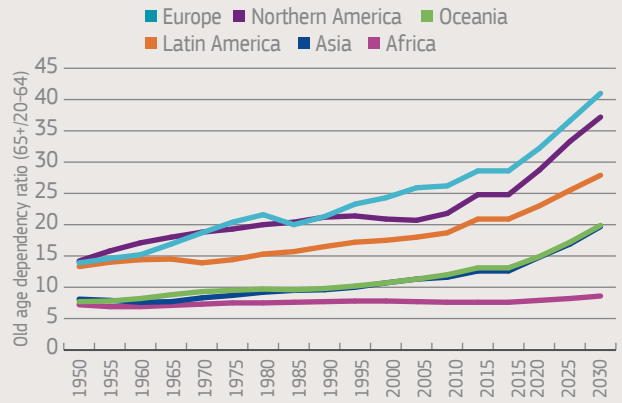
Source: International Labour Organisation

As social trust is impaired, nativist and anti-liberal attitudes gain political ground. Mainstream politicians are increasingly perceived as detached from their constituencies' concerns, and ineffective in delivering on their promises of progress and better life. Such sentiments are too often accompanied by reluctance towards openness, international trade and liberal democracy. Politically, this has been reflected in a shift away from the middle ground and in rising support for populist, anti-democratic and anti-establishment parties.[34]

2. Trials and tribulations in the age of longevity

As the European labour force shrinks in many corners, in line with lower fertility rates and retiring baby boomers, concerns have been growing that the younger generations, smaller in size, will have **to shoulder an outsized burden in supporting the care needs for a now top-heavy population** (Figure 12). With this in mind, important questions arise as to whether fewer workers overall means lower GDP and slower growth, or whether **the new wave of technology could counter this trend by raising productivity and well-being.**

Figure 12: The number of elderly persons as a share of those of working age is growing faster than ever



Source: United Nations Population Divison 2017

At the same time a number of **converging demographic and economic trends have brought four very different generations** with different sets of generational values, needs, skills and expectations to work together. Longevity and improving quality of life means that people are active in the workforce for longer, thereby requiring that workplaces, employment practises, health and safety policies, adapt accordingly. At the same time, Millennials and Generation Z, generally defined as digital natives, are also more likely to have the skills required for the changing working environment and may be more resistant to traditional workplace hierarchies structured on the basis of age or experience. **This generational diversity with regards to the value of work, attitudes towards employment relations, expectations regarding loyalty, obligations and rights at work, as well as views on work-life balance will further impact management practices, hiring and human resource policies.**

3. The skills imperative

Among the key factors that will determine our societal and economic future are education and skills. On this front, Europe is home to some of the most innovative educational and advanced vocational training systems in the world. It is therefore worrying that across Europe, around a quarter of the adult population struggles with reading and writing or poor numeracy, and almost twice that number lack adequate digital skills. Worse still, we see increasingly poor performance in basic skills among the young. The latest results of the programme for international student assessment (PISA) survey are unfortunately unambiguous: although some Member States achieve high standards of excellence overall and equity in educational outcomes, most have not been making sufficient progress in reducing the percentage of low achievers in reading, science and mathematics.[35]

At the same time, swift digital transformation is actively forging new educational priorities. Ease of access to enormous amounts of information and new technological tools has fundamentally transformed the skills required to live and work in fast-changing digital economies. Alongside the corresponding demand for technical skills, there is a growing need for critical and creative thinking. To this end, lifelong learning is no longer a luxury for priveledged workers but a necessity that public, private and educational institutions are already having to contend with. As lifespans continue to increase, it is likely that the education acquired in the early stages of life will not support people through their 100th year life.

The challenge now is to bridge known educational gaps while simultaneously designing agile systems of learning that are able to anticipate the skills and workplace needs of the future. Here is where institutions can make a critical contribution. Coordination and guidance from the EU level could facilitate trade unions, associations of employers, education and training institutions, and local authorities to work more closely and use data to predict future skills needs in specific sectors and locations.

4. Rethinking the social contract: what is 'work' and what should or shouldn't be attached to it?

The social contract used to apply to an ideal where a male breadwinner in full-time, open-ended employment financially supported a family while his wife performed unpaid care work at home. Today, standard job contracts are on the decline, and family models and social perceptions are undergoing profound change. There is now a powerful push to acknowledge unpaid care and other work for what it is: work. Tellingly, if a person spends six hours a day caring for their child or volunteering, it is not considered 'work'; whereas if that person spends six hours looking after somebody else's child for a wage, it is, and is thus covered to some extent by labour and welfare laws.[36]

It is increasingly evident that a new social contract cannot be attached to old models of work, and that a progressive and inclusive one is urgently needed. Social insurance has not changed much since its inception in the 19th century: most benefits are financed by dedicated taxes on the wages of formal workers and tend to cover primarily those workers. But as work becomes less standard and worker's wages garner a shrinking share of the economic pie, the very foundations of modern welfare systems are being shaken. And, where robotisation and automation replaces rather than augments workers in the industrial and service sectors, significant tax and social security revenues would be lost, while at the same time governments would need additional revenue to support the transitions of workers into new jobs.

Table 2. Experimenting for the future

Can Less be More? The high potential (and productivity) of a shorter work week

Current trends are full of contrasts: job polarisation is resulting in over-work for some and under-work for others, work-life balance is out of reach for many, stress and occupational health issues are on the rise, and women's once dynamic entry into the labour force is stalling.[37] Could a single approach address all these qualms at once? An increasing number of innovative companies and governments are experimenting. Preliminary trials in places like Amazon, Google, Toyota, Sweden, and Germany[38] indicate that **a shorter work week can translate into higher productivity, more inclusive workplaces, happier workers, and more satisfied customers**.[39] If Henry Ford was able to trim down the work week in the 20th century,[40] then, many are asking: what's holding us up in the 21st? Analysts argue that such a transition is no pipe dream: reduced working hours with stable wages could be made a reality with a bigger slice of productivity gains being invested in free time.[41]

Universal Basic Income: A utopian ideal or future human right if designed properly?

Projections of future job automation (Table 1) and the current scale of labour market polarisation are giving rise to pressing questions about the link between work and livelihood. **In a world where work may be neither guaranteed nor able to cover basic human needs, many argue that a universal basic income (UBI) may be not so much a distant utopia as a baseline necessity.** The idea of providing all citizens an unconditional stipend robust enough to maintain a dignified life is not new, having been proposed as early as 1797 by Thomas Paine.[42] In recent years, however, alongside swift economic change and political turmoil, UBI has seen a fresh raft of pilot projects rolled out around the world. Preliminary outcomes underline more than ever that the devil is in the details: unambitious stipends that merely streamline existing benefits while being insufficient to maintain living standards, end up subsidising low-paid jobs. More generous and currently designed experiments[43] continue to explore whether people who receive an UBI take up study, creative endeavours, or even entrepreneurial ventures, as well as what the costs and benefits may be.[44]

Can co-operatives democratise a concentrated digital world?

There is little doubt that the future of work is closely entwined with the emergence of revolutionary new technologies. But so far, the corresponding revolution in social outcomes has led to a deepening concentration of capital ownership and a persistent gap between haves and have-nots.[45] **Proponents of co-operatives and other business models characterised by greater empowerment of workers argue that technological gains need not automatically lead to societal polarisation.** Rather, co-operatively owned and operated digital enterprises, for example, hold the promise of re-tuning incentives toward better outcomes for both users and workers, while shifting away from profit maximisation for a narrow set of external investors.[46] These ideas are already being put into practice across a range of occupations with co-operative models gaining a foothold among ride-hailing aps, a range of care and domestic workers, IT services, and freelance workers.[47]

As of yet, no silver bullet has emerged for financing and providing social welfare to an increasingly flexible and polarised global population. But the growing demand for a stable and inclusive social fabric necessitates closer examination of current structures and bolder experimentation with alternatives. For one, the rising concentration of capital – and the simultaneously rising share of income going to capital rather than labour – calls into question the funding of social benefits through taxes on labour rather than capital. As regards nascent discussions about automation tax policy or levying a value-added tax on robot activities, these would require a cross-border approach.

To address the aspirations of citizens who are used to constant progress from one generation to the next, policymakers are thus looking for a novel policy toolkit. Experimenting with a plurality of new models can offer new insights and knowledge that has the potential to help manage a historic and undoubtedly challenging transition. Such innovation is already happening on a national, regional, local and company level (Table 2). Initial findings indicate that the impact and effectiveness of new models depends strongly on a range of factors – from the design of policy details, to the structure of the particular society and economy in which they are applied – but also offer optimism for an inventive and more inclusive social landscape.

FORESIGHT EXERCISE

Scenario 1: Carrying on

- Non-standard contracts continue to grow in volume, increasingly displacing standard full time jobs, but this trend is not accompanied by major changes in company, regulatory, or ownership structures.
- The social contract is renegotiated on an ad-hoc basis, establishing a **patchwork of differentiated rights** for non-standard workers, which feed further societal polarisation and discontent.
- **Automation proceeds but is slowed** by the loosening of worker protections and consequent suppression of wages worldwide, which makes humans temporarily competitive with robotisation.
- Political and social angst continue to grow globally, but **global migration patterns remain moderate in the short term** due to steady job creation and precarious working conditions.

Scenario 2: Work, distributed

- Work relations of the past are completely overhauled by the simultaneous rise of urbanisation, flexibility, and the scaling up of decentralised production and ownership models. Workers no longer have one boss or workplace, but rather perform specialised tasks either in contracts or in platform-based exchange systems.
- The **disaggregation of jobs into tasks co-evolves with and accelerates automation**, as humans specialise in tasks requiring creativity, emotional intelligence and critical thinking, and machines perform routine manual and cognitive tasks.
- Labour movements leverage ICT to organise at an international scale, advancing a new model of 'start-up union' as a way of organising a global labour force that is no longer tethered to one employer or country but is nonetheless motivated to distribute wealth more fairly, and to **facilitate more pathways for legal migration**.
- Flexicurity 2.0 sees **the larger scale experimentation with models of social protection and benefits**, thereby incentivising a 'race to the top' for attracting human capital.

Scenario 3: Big tech, big mama

- **Initially growing automation is coupled with further concentration of capital** among digital giants. Policy lags the speed of technical and social change, and international conglomerates set up **corporate social security schemes** that are gradually expanded to be in direct competition with faltering public systems.
- As capital's share of income grows, large multinationals continue to take on certain previously publicly-provided functions, augmented by their ability to finance regulatory capture and expand across borders. They leverage the immense availability of customer data to nudge workers and consumers via behavioural micro targeting, thus hyper-individualising the provision of health and social services and ushering in both efficiency and discriminatory premiums,
- Worker polarisation exceeds Gilded Age proportions **and automation stalls as a new class of negative wage earners becomes cheaper than technology**.
- **Economic migration reaches an unprecedented scale**, with moderate political parties in established liberal democracies receding further into obscurity and government functions reduced to maintaining national borders and security.

Scenario 4: Automation for all

- **With exponential gains in AI, the scale of automation exceeds expectations** but is coupled with mass social movements stirred by declining economic gains for the majority of people.
- Across countries and regions, well-organised proponents of redistributing technological gains garner support in public opinion and begin to coordinate policy ideas aspiring to a future where machines perform most work while humans are free to undertake previously non-remunerated activities.
- Such a transition is not smooth, with new cross-border movements attempting to re-conceptualise the social contract and redistribute capital ownership against a backdrop of fierce resistance from elites.
- In the short to mid-term, **uncertainty peaks and migration patterns become volatile.**

Notes

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