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The future of work and its implications for social protection and the welfare state

Franziska Gassmann and Bruno Martorano¹

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Abstract

During the twentieth century, welfare states were instrumental in confining economic and social inequalities in Europe. Stepping into the twenty-first century, labour market risks have transformed. The unprecedented technological transformation has changed the way we work. The trend towards new forms of employment is no longer a marginal phenomenon. People switch between jobs, type of employment or (temporarily) leave the labour force. Across OECD countries, 16% of workers are self-employed and another 13% are on temporary employment contracts (OECD, 2018b). Employment became more precarious and labour market relations much more diverse. This raises the question how societies can take on the opportunities, challenges and risks that the rapid technological development may bring. The changing nature of work along with other challenges, such as demographic ageing, changes in family structures, globalisation of trade, or migration necessitates adaptations to the welfare state in order for it to continue functioning effectively and efficiently. This paper reviews the challenges for universal social protection in a rapidly changing world of work and discusses policy options for social protection systems that protect and stimulate human development. We first review current trends and predictions as to how the future of work might look like. New types of jobs and forms of employment are already on the rise, which has effects for individual workers and society. We then discuss the implications for social protection and the welfare state. The changing nature of risks associated with new forms of employment may require a redesign of current social protection systems. The discussion provides possible solutions and country examples on changes in social protection systems and financing strategies, including reforms of current social insurance schemes, social assistance programmes and active labour market policies.

Key words: non-standard employment, social protection, Europe

JEL codes: H55, I38, J21

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Introduction

Technological changes have been a mark of progress of the human kind. From the first handcrafted tools used by our ancestors to the invention of steam engines, technological innovation has transformed our form of production and hence living standards. However, recent technological changes, sometimes dubbed as the “4th Industrial Revolution” (Lasi, Kemper, Fettke, Feld, & Hoffmann, 2014) have been astoundingly different. Driven by the exponential increase in the computational power of machines, scientific advancement in robotics and automation, and data digitalisation, the impact of this wave of technological change is seemingly unprecedented in its speed and scale. According to a report by McKinsey Global Institute, for example, the disruption created by Artificial Intelligence (AI) is estimated to be ten times faster and 300 times the scale compared to the Industrial Revolution in the late 18th and 19th centuries (Dobbs, Manyika, & Woetzel, 2015).

This unprecedented dynamic transforms manufacturing and businesses making it more flexible, decentralised and efficient (Lasi et al., 2014). Some argue that the impact of new technologies is different this time “... because their potential to substitute labour for capital is very high...” (Nomaler & Verspagen, 2018). This raises the question how societies could take on the opportunities, challenges and risks that this rapid transformation may bring. One of the items particularly high up on the agenda of governments and international organisations is its imminent impact on the future of work.

To fulfil the globally agreed Sustainable Development Goals (SDGs) of providing “decent work and sustainable and inclusive economic growth for all”, it is estimated that over 600 million new jobs need to be created by 2030, considering only population growth (ILO, 2018). However, research has shown that on average 9% of jobs in developed countries are at a high risk of being displaced by automation (Arntz, Gregory, & Zierahn, 2016). The debate, as a result, lies in whether new technology can create enough new jobs and whether displaced workers can be sufficiently and efficiently up-skilled to stay in the labour market.

Apart from the net impact on employment, recent technological development also changes the way we work. The trend towards new forms of employment is no longer a marginal phenomenon (OECD, 2018b) not the least due to the rise of digital platforms, globalised offshoring and changes in people’s life styles. Across OECD countries, 16% of workers are self-employed and another 13% are on temporary employment contracts (OECD, 2018b). Gig jobs, crowd workers or app-based work are just some of the new non-standard employment (NSE) that provide opportunities and autonomy for workers, but are also criticised for their lack of protection and precarious working conditions (De Stefano, 2016).

The change in labour demand and the move away from traditional forms of employment poses risks for both the individual and society. Existing social protection systems, modelled after traditional post-war career paths of a single skill set for a single employer, may no longer be adequate to protect workers and their families against economic shocks or job displacement. At the societal level, income inequality may further increase if no additional support is provided to displaced workers in an increasingly skill-biased labour market. The possibility of substantial destruction of work and atypical employment excluded from the current social security systems

will potentially decrease contributions and thus jeopardise the financial sustainability of the welfare states.

The objective of this paper is to review the challenges for universal social protection in this rapidly changing world of work and discuss the policy options to organise and fund social protection systems in the future. The guiding question is what would be an optimal social protection policy that protects and stimulates human development. Social protection in this paper refers to “the set of integrated policies designed to ensure income security and support to all people across the lifecycle...” (ILO & World Bank, 2015). It includes benefits for children and families, maternity, unemployment, employment injury, sickness, old age, disability, survivors, as well as health protection (ILO, 2017). In most countries, these different policy areas are covered by a mix of contributory schemes (social insurance), and non-contributory tax-funded social benefits and services (social assistance).

The paper is structured as follows: the first part establishes the context by reviewing current trends and predictions as to how the future of work might look like. Both, the level and type of employment is affected by new technologies. New types of jobs and forms of employment are already on the rise, which has effects for individual workers and society. The second part discusses the implications for social protection and the welfare state. The changing nature of risks associated with new forms of employment may require a redesign of current social protection systems and the way they are financed. It provides possible solutions and country examples on changes in social protection systems and financing strategies, including reforms of current social insurance schemes, social assistance programmes and active labour market policies. A concluding section summarises the key points.

How will the future of work look like?

Changes in the level of employment

The possibility of labour displacement in the face of technological change is nothing new. “Technological unemployment” was suggested by Keynes (1930) at the height of the Second Industrial Revolution. Schumpeter (1942) used the term of “creative destruction” to stress that while technological innovation does disrupt the status quo, it should also be seen as a necessary process to another equilibrium. The current literature seems to agree with these two scholars that changes in labour market structure, employment form and income distribution are destined to happen in this fourth industrial revolution. However, what the equilibrium may look like is highly uncertain. Indeed, different studies resulted in rather different predictions.

Vermeulen, Kesselhut, Pyka, & Saviotti (2018) summarise this discussion drawing three broad scenarios:

1. End of work - human work force will eventually be replaced by robots even in those areas not characterised by routine tasks;
2. Structurally lower – technology will replace some jobs definitively, but some displaced workers find jobs in newly created sectors after up-skilling or re-training; and

3. Rebound – technology induces an initial drop in employment, but it soon returns to a regular rate (or more) as new jobs and sectors are created and workers could change to different sector.

Despite the uncertainty over the future, it is evident that the number of robots in industry, or other fields, is increasing quickly. “By 2019, 1.4 million new industrial robots will be in operation, raising the total to 2.6 million worldwide” (World Bank, 2019: 20). Following this trend, futurist writers and technological business leaders such as Ford (2015), Bill Gates (Fortson, 2018) and Elon Musk (CNBC, 2016) have publicly suggested that automation will take over all jobs in the future.

Yet, not all human workers will be replaced by automation (Goolsbee, 2018). Indeed, the employment rate remains high even in countries showing a high rate of robot density per worker (World Bank, 2019). Different scholars tried to predict the potential changes in employment. Frey and Osborne (2013) estimated that over 47% of jobs in US market are susceptible to computerisation, while a McKinsey report (2017) suggests that between 73-375 million jobs (around 3 – 15% of global workforce) will be at risk of job displacement. The International Federation of Robotics is more conservative. They estimate that only about 10% of the jobs are fully automatable (International Federation of Robotics, 2018).

The OECD (2018a, 2019a) also seconds the “structurally lower” position mentioned above, which states that technology will replace some jobs definitively, but a major proportion of displaced workers will find jobs in newly created sectors after up-skilling or re-training. Based on the 2012 Survey of Adult Skills (PIAAC) from 21 OECD countries, Arntz, Gregory, and Zierahn (2016) estimated that on average 9% of the jobs in these countries are at a high risk of being displaced by automation. Country differences range from 12.2% in Germany to 5.9% in South Korea. Interestingly, these two countries (together with Singapore) also show the highest robot density per worker in 2018 (World Bank, 2019).

Technological change might also create new job opportunities and new job positions. There are several historical examples such as the introduction of ATMs in the United States in the 1970s that contributed to create more bank teller jobs (ILO 2018). Currently, technological change is also promoting new opportunities increasing the “proximity to markets, facilitating the creation of new, efficient value chains” (World Bank, 2019:21). Over the last years, technology promoted the creation of new job positions that did not exist before including IT administration and development of smartphone applications as well as “the creation of jobs through working online or joining the so-called gig economy” (World Bank, 2019:20).

The World Bank (2019) has compared different predictions from recent publications and concluded that the results differ so widely that no concrete figure could be given. Which scenario will eventually prevail depends on a number of factors:

- The speed of full automation. If full automation occurs within a short period of time, the adaption for the society would be difficult. However, the speed of automation is determined not only by technological advancement, but also by the investment costs (Goolsbee, 2018);

- The mobility level of the labour force within and across sectors, as well as retraining opportunities and infrastructures to assist workers in changing jobs (Vermeulen et al., 2018); and
- The extent to which the education infrastructure responds with relevant training adapted to the technological change and supplies necessary skills (Goldin & Katz, 2007).

Change in type of employment

Despite the uncertainty on the net effect on employment, it is clear that technology is promoting a structural transformation of the economy. A widely discussed observation is the “hollowing-out” effect on the labour market (Katz & Margo, 2014). It suggests that particularly middle-skilled, routine-based jobs (which are often in the middle of the wage distribution) are slowly replaced by automation and machines. Also called “job polarisation” by Goos and Manning (2003), this phenomenon is observed in many advanced economies. For example, from 1993 to 2006, the average decrease in middle-skilled employment in 16 EU countries was 8% - with Austria (14%) and France (12%) recording the largest decrease (Goos et al., 2009). Similar trends have been reported for the USA by Autor (2015), Acemoglu and Autor (2011) and Graetz and Michaels (2015). Specifically, it seems that workers in transportation, logistics, office and administrative support are more likely to experience replacement (Frey & Osborne 2013). A substantial share of employment in service occupations is also highly susceptible (Nedelkoska & Quintini, 2018).

Apart from people engaged in middle-skilled and routine-based jobs, young workers are identified as most vulnerable to automation. Although they may be more tech-savvy than the older generation, their entry into the labour market is usually through occupations that are at a higher risk of automation. For example, Nedelkoska & Quintini (2018) report that almost 34% of them work in sales and personal services. Gender also plays a role in the risk of job displacement by automation. PWC (2018) predicts that female workers will be hit harder by automation. However, Acemoglu & Restrepo (2017) report that the adverse effect for men is estimated to be 1.5 - 2 times higher than for women.

New jobs and non-standard employment

Technology is also affecting the way and the conditions under which people work (World Bank, 2019). Firms have benefitted a lot from the implementation and development of new technologies. For example, “digitalisation lowers transaction costs, allowing firms to outsource more activities, and blurring the boundaries of the firm.” (OECD 2018b: 1). But, firms have also benefitted from important institutional changes. Indeed, “many countries have eased regulatory restrictions on firing and reduced other worker protections to facilitate adjustment to shocks by making markets more flexible.” (Bussolo et al 2019: 38). In particular, governments in continental Western and Southern Europe made provisions in their laws to allow “atypical” contracts, including part-time work, marginal employment, fixed-term contract work, temporary work and self-employment. The use of non-standard employment (NSE) allows firms to save costs. Temporary workers are often paid less compared to standard employees. By outsourcing work firms also save on real estate costs and the costs associated with administering and managing workers (George and Chattophadyay, 2015). Firms directly benefit “... from paying lower or no social contributions” (OECD, 2018b: 1). In 2018, the share of non-wage costs, such

as employers' contributions to social insurance, accounts for a quarter of total labour costs in the European Union (Eurostat, 2019). Across the OECD, employers' social contributions account for 14.4% of total labour costs at the median wage (OECD, 2019c). As a result, there is an increasing proliferation of non-standard employment contracts put into place alongside the existing traditional contracts (Bonoli, 2016; Eichhorst, Marx, & Wehner, 2017).

NSE offers flexibility to both employers and employees. Digital innovations make self-employed entrepreneurship more accessible and as such, they open a new world of opportunities across geographical barriers and time zones. The flexibility of new employment forms also includes a labour force that may not have been able to work before (e.g. people with disabilities or stay-at-home moms). NSE work is not a marginal phenomenon anymore, as 1 out of 7 workers is now self-employed and 1 in 9 employees is actually on a temporary contract (OECD, 2019a). For example, the share of involuntary part-time workers in total employment more than doubled in Spain and Italy from 2005 to 2015. A similar increase is also witnessed in Australia and France (OECD, 2019a).

While these non-standard employments are more flexible, the OECD observes that the quality of these non-standard jobs, in particular platform jobs, is often unsatisfactory and may lead to a "race to the bottom" if not properly regulated (OECD, 2017). Even though crowdsourcing platforms normally comply with general commercial law or consumer protection regulations, workers have to follow the platform's conditions. They have little or zero bargaining power (Valenduc & Vendramin, 2016). The lack of unions or any other form of workers' cooperatives to fight for their rights further increases the vulnerability of old and new NSE (Westerveld, 2012). The European Commission found that in 2018 around 13-17% of NSE workers are unsure whether they have access to social protection benefits, such as unemployment, old-age pension, maternity/paternity or sickness benefits (Codagnone et al., 2018). The same survey reports that around 50-60% of the respondents thought applying for such benefits is difficult. The result is that these changes have contributed to create "dual labour markets, whereby only skilled and experienced workers continue to benefit from high levels of protection, while the rest face more vulnerable employment conditions" (Bussolo et al. 2019:38).

But, who are the NSE workers? They are a heterogeneous group, including those that voluntarily engage in self-employment as entrepreneurs, those that take up platform work as their second income or those that are forced into NSE work. The losers in this process are medium and low skilled workers who were most affected by the polarisation process associated to technological changes. This group, also referred to as "dependent independent workers" (Westerveld, 2012), are most vulnerable due to their insecure labour market situation and the often low and unstable income. Women, the youth and migrants are particularly vulnerable groups in the labour market and more likely to be in NSE. For example, while women account for less than 40% of total employment globally, 57% of all part-time jobs are held by women (ILO, 2016). Young people and migrants are also more likely to be engaged in NSE. In Europe, 50% of the 15-24 year olds have NSE. The fact that a relatively high share of young people has NSE is possibly due to first jobs having more likely probation contracts. Among female non-EU migrants, 21% are working in temporary jobs compared to 10% of the European women (ILO, 2016). Insufficient local language skills and unrecognised qualifications of migrants are reasons for their higher likelihood of being in NSE.

Distributional consequences

According to the Skill-Biased Technological Change hypothesis, technological change is expected to stimulate the demand and wages of high skilled workers (Autor, Katz and Krueger, 1998). Some empirical studies confirm that workers in the top of the distribution benefitted more from these changes (Acemoglu and Autor 2011; Acemoglu and Restrepo 2017; Graetz and Michaels 2015).

Yet, the skill-biased technological change framework fails to fully explain current changes (Autor 2015; Basu, Chau and Soundarajan, 2016). Indeed, in many countries, nearly all job losses were associated with regular work while the increasing job creations were mainly associated to non-standard employment, as explained above. In particular, the decrease in the number of standard workers performing middle-skilled jobs were mainly compensated by the increasing number of jobs under non-standard employment contracts requiring the performance of low-skilled tasks (ILO 2016). Not surprisingly, “non-standard workers (excluding the self-employed) are more likely to be found in the lower part of the earnings distribution, particularly in the lowest three deciles” (OECD, 2015: 167). For example, in Germany and Canada, around two-thirds of employees in the first quintile of earnings are in jobs under non-standard employment contracts (OECD 2015). By contrast, the share of individuals in non-standard employment (NSE) is very low at the top of the distribution (OECD 2015). Moreover, workers employed under non-standard contracts face wage penalties. They earn lower wages compared to people under standard contracts (OECD 2015). Interestingly, the wage penalty is larger for temporary workers while it is less significant in the case of part-time workers. As a result, labour market segmentation and the casualisation of employment are fuelling further disparities.

Moreover, poverty rates are higher among workers employed under non-standard contracts (OECD 2015). The at-risk-of-poverty rate for the self-employed is three times higher compared to the employed with more “traditional” contracts in Europe in 2015 (Spasova, Bouget, Ghailani, & Vanhercke, 2017). Most worrying, young people with temporary contracts have a lower chance of moving on to more stable jobs contradicting the idea that these contracts represent a stepping-stone towards permanent employment. In particular, “they have lower training opportunities, which slows down their career advancement and the opportunities for closing the wage gap with standard workers; and they are more likely to rotate between unemployment and non-standard work, which negatively affects their lifetime earnings” (ILO 2016:219-220). Lastly, non-standard workers – and especially those “on-demand” or in the context of the “gig” economy - do not benefit from the same protection as workers working full-time and on long-term contracts. Indeed, buyers or platform organisers do not have the responsibility over the well-being of this workforce as traditional employers (De Stefano, 2016).

Implications for social protection and the welfare state

The main objectives of a welfare state are to support living conditions, reduce inequality and foster social integration while being at the same time efficient and administratively feasible (Barr, 2012). Essentially, a welfare state supports the poor, addresses market failures and promotes economic growth (Barr, 2018). Barr (2018) considers the welfare state as a risk-sharing device. It provides insurance against future events and relieves poverty; it provides a response to private

insurance market failures, particularly with respect to unemployment and health; and it allows households to take risks thereby contributing to economic growth.

However, the changing nature of work along with other challenges, such as demographic ageing, changes in family structures, globalisation of trade or migration necessitates adaptations to the welfare state in order for it to continue functioning effectively and efficiently. For many decades, European welfare states have provided security for workers and their families. They were designed at a time when the world of work looked rather different. In post-war Europe and other advanced economies, fulltime employment for the same employer over many years was the norm and a single skill-set could serve most workers throughout their working life.

The changing nature of risks

Labour market risks have changed. People switch between jobs, type of employment or (temporarily) leave the labour force. Overall, employment became more precarious and labour market relations much more diverse (Barr, 2018). The de-commodification of work is a key achievement of post-war welfare states (Esping-Andersen, 1990). Workers were no longer at the perils of their employer, but they were protected by labour regulations and social insurance.

The rise in NSE and particularly of the various forms of platform works seems to reverse these achievements. The fact that humans are considered as a service in the gig-economy (see de Stefano, 2016) is exemplary for the re-commodification of work and workers. The lack of human contact in online transactions makes the crowd-workers invisible and contributes to the further dehumanisation of these activities (de Stefano, 2016). Semantics further exacerbate this perception given that platform work is often referred to as a specific activity (task, ride, service), but hardly called ‘work’ (or worker, for the same). “... [T]he ... catchphrase ‘gig-economy’ epitomizes this, as the term is often used to indicate a sort of parallel dimension in which labour protection and employment regulation are assumed not to apply by default” (de Stefano, 2016:5).

Among NSE workers, social insurance coverage is much lower as many of them do not meet the minimum thresholds, or in case they are eligible, benefit levels may not be sufficient because of irregular and/or low contributions made (ILO, 2017). NSE workers often work fewer hours, have lower earnings and change jobs more frequently which either excludes them entirely from social insurance schemes, or results in benefits that are considerably lower compared to standard employees (Behrendt and Nguyen, 2018; Bussolo et al., 2019).

The coverage gap has both immediate and future consequences for the individual NSE worker. Because many NSE workers have no, patchy or too short contribution records with social insurance, they are not eligible for benefits in the event of job loss (unemployment), maternity, sickness, old age and other work-related contingencies. They are insufficiently protected against these risks, which can be catastrophic in the absence of insurance and increases the risk of a life in poverty.

Social insurance systems are not prepared for new forms of work

Current social insurance schemes do not align well with the characteristics of NSE due to common statutory requirements, such as the minimum duration of an employment relationship, earnings or hours (ILO, 2107). They have inherent barriers for the self-employed and employees

or workers with irregular, short, or interrupted employment records (Buschoff and Protsch, 2008; Eichhorst et al., 2017; Hinrichs and Jessoula, 2012; Loprest and Nightigale, 2018; Spasova et al., 2017).

Social insurance systems do not exclude NSE workers by default. Different types of employment and contracts have different implications for participation in and entitlements to social insurance. In advanced economies, most temporary workers are covered by unemployment insurance systems if they meet the minimum duration (Behrendt and Nguyen, 2018). However, because temporary workers change jobs more frequently and might also be more likely to have unemployment spells, unemployment benefit eligibility is lower compared to workers with permanent contracts (ILO, 2017). Casual workers are engaged on an as-needs basis with limited rights and are often excluded from social insurance systems (Behrendt and Nguyen, 2018). The irregular working hours in on-call employment lead to unpredictable income from work, and may result in interrupted employment affecting the duration needed to be eligible for social insurance entitlements. Social insurance coverage of part-time workers depends on the number of hours they work and the statutory minimum required. They are generally covered if the contract exceeds a certain minimum hours, but part-time workers on short hours contracts hardly meet the requirements and are hence excluded (ILO, 2017; Behrendt and Nguyen, 2018). Unemployment insurance for self-employed workers suffers from moral hazard problems. It is difficult to distinguish between demand fluctuations and voluntary idleness (OECD, 2018b). Not surprisingly, self-employed workers are rarely insured against unemployment (8 out of 28 EU). Maternity insurance, on the other hand, is available for most female entrepreneurs in Europe (all but 6) (OECD, 2018b).

Workers engaged in platform work ('gig-workers') are often classified as independent contractors and are as such not covered by existing labour and social protection laws (ILO, 2017; de Stefano, 2016).² This entails that they are liable towards their clients and that they are also responsible for all insurance obligations, employment laws and labour regulations (Rogers, 2015b in de Stefano, 2016). Shifting risks to workers is not only an issue for platform workers but affects many other NSE workers as well, such as in case of zero-hours contracts or on-call contracts. This is sometimes referred to as the casualisation of labour or the demutualisation of risks (see de Stefano, 2016). Misclassification of employment relations contributes to the further informalisation of work (de Stefano, 2016). Workers in disguised employment relations do not benefit from labour and social protection. As platform workers are classified as independent contractors, they have no access to statutory employment and social protection rights, such as unemployment benefits, maternity leave or holidays (de Stefano, 2016).

In any contributory social insurance system, employers and employees both make contributions. This raises the question who should pay the employers' contributions in the case of independent or self-employed workers, and how they should be calculated if earnings are volatile. For self-employed workers, this would entail that they also cover the employers' part in the classic social insurance model. Yet, the earnings of self-employed workers often fluctuate which makes it

² Less than ten percent of crowd-workers for which crowd-work is the main source of income contributed to social insurance schemes (Berg, 2016 in ILO, 2017).

difficult to calculate contributions. Moreover, in a bad year it might be challenging for the self-employed to pay the contribution (OECD, 2018b).

An additional challenge relates to the identification of the employer, which might not be straightforward. The OECD calls this the “double contribution issue” (OECD, 2018b:22). On the other hand, some NSE workers deliberately make the choice to become self-employed, use platforms or engage in other forms of NSE. Many are young and well-educated and are as such a low-risk group. The exclusion of this group from social protection systems further jeopardises the risk pooling which is essential for any type of insurance (OECD, 2018b).

The key challenges in a nutshell

Broadly speaking, the two main challenges for current social protection systems are gaps in coverage and a dwindling contribution base. These two are related as reduced coverage leads to lower contributions. However, while the latter is a financing issue, the gaps in coverage has both immediate and future consequences.

Given that our current social protection systems were designed with a full-time employee in mind (OECD, 2018b), the increasing number of workers in NSE or self-employment leads to substantial coverage gaps. Many NSE worker struggle to meet minimum contribution periods. The self-employed are often excluded from social insurance systems or only eligible for some very basic benefits (OECD, 2018b). The increase in the number of NSE workers along with their exclusion from current systems challenges the financial base of contributory social insurance systems (OECD, 2018b). The unequal treatment of workers with different forms of employment creates incentives for firms to shift work to those for which they do not have to pay contributions, that is those with the least protection (OECD, 2018b).

The main challenge for the current welfare states is how to include NSE workers in our social protection systems. On the one hand, the increased job insecurity combined with low pay for many NSE workers lead to increased income insecurity. The increase in job insecurity particularly for NSE workers and lower income from work put a strain on existing social protection systems (Behrendt and Nguyen, 2018). It increases the demand for social protection while at the same time the contribution base is eroding. Due to rules and regulations of current contributory social protection schemes, many NSE workers are not or only partially covered by social and health insurance. This leads to a higher poverty risk in the event of job-related contingencies and a larger burden for tax-financed social assistance schemes. The erosion of the contribution base leads to financing gaps, which puts a strain on existing social protection systems and jeopardises the adequacy of existing systems (Spasova et al., 2017). This imbalance threatens the intra- and intergenerational solidarity of our current systems and the social contract between citizens and institutions.

Proposed solutions

“...the discussion should not be about *whether* there should be a welfare state, but about its precise forms and its distributional objectives” (Barr, 1998:414). Previous responses to welfare state crises since the late 1970s focused on active labour market policies and public sector employment, labour market de-regulation and wage flexibility, the promotion of early retirement or the reduction of benefits (Barr, 1998). Bussolo et al. (2019) call for a rethinking of the social

contract in Europe. Educational attainment is no longer a guarantee for stable full-time employment. The feeling of economic security has gone even though most workers still earn a decent income and are part of the middle-class. A stable social contract finds middle-ground between the market-driven distribution of resources, redistributive public policies and the society's preferences for redistribution of opportunities and outcomes (Bussolo et al., 2019). The polarisation of society may lead to distributional tensions between different groups. This necessitates "...a fundamental rethinking of the principles behind the policies and institutions that regulate markets, define responsibilities and benefits, and redistribute incomes..." (Bussolo et al., 2019:3). Notions of equity, progressivity and universality need to be revisited as underlying principles of the social contract between citizens and government (Bussolo et al., 2019). Firms – who benefitted much more than others from this process of transformation – should play an active role in supporting the reform of social protection systems that are better adapted to the new world of work.

Various measures have been proposed how to better align social protection systems with the new working realities and effectively protect individuals and their families. They range from changes in labour laws and regulations, adjustments to current schemes to more radical reforms, which would structurally change our welfare state systems. The equal treatment of different forms of employment is the underlying principle for most proposals: "Extending social protection to all forms of employment is not only about ensuring fairness and better protection for workers and their families, but also about creating a more level playing field for different forms of employment, as well as facilitating labour market transitions and labour mobility" (Behrendt and Nguyen, 2018:8).

There is no single solution to address the undercoverage of NSE workers and ensure the effective social protection for all. The following sections review different policy proposals that are currently discussed by the various stakeholders in national and international organisations and academia. Where relevant, references are made to country examples, which are summarised in the annex. Every option has advantages and disadvantages. Eventually, the choice is a political question and depends on the preferences of society.

Labour laws and regulations

For the ILO, the investment in the institution of work means primarily to strengthen the rights of workers to economic security, autonomy and equal opportunity. This is particularly important for the new technology-related NSE workers in European countries where their legal status is often blurred by ambiguous employment forms, such as platform workers, or self-employed crowd workers. This has implications for their social protection coverage (ILO, 2019).

There is a tendency to treat jobs in the gig-economy as a separate category as if it concerns a separate economic sector with its own rules. Yet, the gig-economy is not a separate silo in the economy and we should not engage in a separate discourse on platform work, but include this work in the overall discussion on how to improve the protection and better regulation of NSE (de Stefano, 2016). Most importantly, jobs in the gig-economy should be recognised as work to counter commodification (de Stefano, 2016). Hence, quick legislative responses, such as the creation of new categories of employment in the gig-economy should be avoided. This would also ensure that general labour regulations apply to this form of work (de Stefano, 2016).

Platform workers are generally considered as self-employed. Yet, some platforms intervene in the work to such an extent that they were classified as employers by national courts. Such misclassifications can be addressed by labour laws (OECD, 2018b).

The risks frequently associated with NSE are job insecurity, irregular working hours and low earnings leading to increased income insecurity. Within the context of the decent work agenda, the ILO sees potential to improve national labour laws and regulations to improve the position of NSE workers and their social protection coverage. The recommendations are to:

- Address employment misclassification to ensure the recognition of the employment relationship;
- Ensure equal treatment of different forms of work;
- Implement minimum hours to address on-call arrangements and other contracts with very limited hours. This will improve income security and reduce the high variability and unpredictability of work schedules. For example, mandate employers to pay employees that showed up for a shift even if that shift got reduced or cancelled;
- Assign obligations and liabilities in multi-party employment or sub-contracting arrangements allowing workers to claim their entitlements from any party involved;
- Restrict the use of NSE to prevent abuse, such as successive fixed-term appointments;
- Strengthen collective bargaining for NSE workers; extend existing collective agreements across occupational or economic sectors irrespective of the type of employment to ensure the protection of the workers (ILO, 2017).

Measures to ensure equal treatment between self-employed and wage workers may prevent firms from re-classifying workers as self-employed and avoid the payment of social insurance contributions. This would increase coverage of workers in dependent self-employment and reduce the number of workers in disguised self-employment (ILO, 2017). While there is in principal no difference between self-employment in traditional markets and on platforms, the latter has the advantage that all transactions are online and as such traceable. This feature can be exploited to increase tax compliance and social protection coverage (OECD, 2018b).

The OECD (2018b) also suggest introducing a wage premium for flexible work arrangements, such as independent contractors, on-call workers or those with flexible hour contracts. The wage premium would compensate for the entrepreneurial risk as in the case of Australia.³

Strengthen and extend existing social insurance schemes

It is essential to maintain and strengthen existing social insurance schemes for the protection of workers in NSE and self-employment as the level of protection is generally higher than with non-contributory schemes (Behrendt and Nguyen, 2018). Earnings-related contributory schemes are important for the sustainable financing of social protection and guaranteeing adequate benefits.

Extending statutory social insurance coverage to currently excluded workers ensures the equal treatment of different contractual arrangements (Behrendt and Nguyen, 2018). In order to

³ See Annex for more details on country examples.

include NSE workers in social insurance systems, existing minimum thresholds with respect to hours, earnings or employment duration need to be lowered or eliminated. Ideally, every hour counts towards social insurance contributions, as essentially is the case in the Dutch system (ILO, 2017; Behrendt and Nguyen, 2018). Such an approach also accounts for instable incomes and limited contribution capacity. Extending the period during which contributions are considered will improve access to benefits for workers with interrupted contribution periods as in the example of Denmark (ILO, 2017). Measures to recognise care work as contribution periods facilitate access particularly for women and contribute to the reduction of gender inequalities in social insurance schemes (ILO, 2017).

A lot can be gained by simplifying administrative procedures (registration and contribution), improving access to information and facilitating the portability of entitlements between different insurance schemes and employment statuses (ILO, 2017). Portability is important to protect accumulated benefits from being lost. Schemes should also be adapted to cater for workers with multiple employers (Behrendt and Nguyen, 2018).

Individualise social protection, change contribution system

One of the key features of social insurance – contrary to private insurance – is that the government can require everybody to join which significantly increases the risk pool (Barr, 2018). Yet, if fewer workers have continuous employment records, it is debatable whether collecting contributions through employers is still the most effective way (Barr, 2018).

Undercoverage is particularly salient for casual and self-employed workers. Including self-employed workers in social insurance systems is important given the increase in self-employment and platform work. Innovative ways to cover specific categories of workers include special funds, which are either project based or cater for a specific profession. Germany's insurance fund for artists, for example, covers freelancers and those working on short-term contracts (ILO, 2017). Although the system seems to be effective in collecting contributions from consumers, providing an adequate pension remains a challenge. The fund suffers from adverse selection as mainly low-income earners join the fund in order to benefit from full health insurance (OECD, 2018b).

The individualisation of social protection, which essentially means untying contributions from employment relations, is offered as an alternative solution. Barr (2018), for example, recommends the introduction of notional defined-contribution systems. All contributions made by worker, employer or state are individually recorded in one account. It is not a new idea, but recently gained traction especially for platform workers (Etsy, 2016 in OECD, 2018b). Such individual accounts could be organised by simple saving plans with limited options (mandatory or with automatic enrolment).

Given that “individual activity accounts” (OECD, 2018b:25) hardly include elements of risk pooling common to our current social insurance schemes (after all, they collect individual contributions for individual use), they may not be sufficient to protect against catastrophic risks (OECD, 2018b). Nor does it solve the double contribution issue for the self-employed unless social contributions can be collected from their clients. To address the double contribution issue, one option is that the independent worker pays both employer and employee contribution,

thereby raising the price of labour as for example in the USA (OECD, 2018b). On the downside, the self-employed worker may not be able to shift the additional costs to the client with the risk that some self-employed workers will prefer the informal sector if transactions cannot be properly monitored (OECD, 2018b). Alternatively, clients could be charged directly as in the case of the German artists' insurance. The government can also subsidise schemes for the self-employed. Yet, this could create adverse incentives for both employers and employees (OECD, 2018b).

Low-income and part-time workers face an additional disadvantage as they hardly accumulate enough contributions for a meaningful benefit unless contributions are subsidised by the government or the government contributes directly (OECD, 2018b; Behrendt and Nguyen, 2018). Alternatively, pension contributions could be based on consumption instead of earnings in the future (Barr, 2018). Another risk of individualised accounts relates to the potential freedom of individuals on how and when to take up the accumulated benefits. Myopia may prevent them from keeping the money until old age, thereby jeopardising the goal of the account (OECD, 2018b).

Private and/or voluntary insurance and corporate social responsibility

Voluntary social insurance schemes have been designed with the aim to include self-employed workers. Yet, these schemes have not been very successful for various reasons. Voluntary schemes do not lead to a substantial increase of coverage (Behrendt and Nguyen, 2018).⁴ Voluntary schemes do not seem to work for NSE workers because of adverse selection. Those with the highest risk are most likely to join. It only works if a voluntary scheme achieves high coverage, which could be supported with public subsidies (OECD, 2018b). Private insurance and savings arrangements cannot replace social systems, which pool risks over large groups and guard the solidarity and equity between groups (Behrendt and Nguyen, 2018). Hence, mandatory schemes are preferred because of better risk pooling and greater financial sustainability (Behrendt and Nguyen, 2018).

Finally, firms and especially multinational companies might play an active role in this process of transformation supporting the extension and coverage of social protection. However, this aspect is still unresearched. Recently, the ILO has started to show some interest in the potential engagement of the private sector in the process of social protection reform. In particular, Tessier et al. (2013) show the cases of two multinational companies, Danone and L'Oréal, which have implemented projects aimed at assuring a minimum level of protection to their employees working in different countries over the world. According to the authors, similar operations could generate positive returns for these companies due to the potential positive effects on their brand attractiveness as well as positive effects on workers' motivations and productivity. However, as highlighted in the same report, governments should be informed in order to give them the possibility to ensure an effective coordination of these initiatives with the other components of the social protection system (Tessier et al 2013).

⁴ For example, only 0.02% of the self-employed are covered in Austria by voluntary unemployment insurance (Spasova et al., 2017).

Extend tax-financed social protection

Another avenue for reform would make social protection more universal by granting entitlements to tax-financed benefits based on need. The OECD, for example, suggests “[i]ncreasing the role of tax-financed social protection elements to help address gaps in existing provisions, i.e. use universal and means-tested benefits to complement benefits linked to employment status and/or the level of contributions” (OECD, 2019b:83). Such an approach would automatically extend coverage to all NSE workers and could reduce the administrative challenge of tracking all contributions. Social assistance is nothing new and available in most EU countries. Health care or health insurance and provisions for maternity leave are already universally available in most countries.

The expansion of contributory and non-contributory social protection can provide a basic level of income security for all in line with the ILO Social Protection Floor Recommendation (ILO, 2017). Earnings-related benefits must remain contributory; but where the primary purpose is insurance (health care) or poverty relief (basic pension), contributions need to be redesigned as the current system through employers is no longer effective; it can even discourage formal sector employment (Barr, 2018). Recognising that contributory social protection is linked to some form employment, the combination with non-contributory measures linked, for example, to residence, allows for the design of comprehensive social protection systems that are equitable and sustainable (ILO, 2017).

Tax-financed non-contributory social protection schemes can reduce coverage gaps and ensure a basic level of protection for all. Non-contributory old-age pensions can support those without or too little contributory entitlements. A flat-rate basic pension based on age and residency, financed from tax revenues, without contribution requirement has the advantage of relieving poverty and reducing the inequality of retirement income between men and women (Barr, 2018). NSE workers can be further supported by tax-financed family benefits, unemployment protection and social assistance. Health risks can be addressed by an insurance scheme with everybody in a single pool (Barr, 2018). Tax-financed health care systems or subsidised health insurance is essential to guarantee a minimum level of protection against health risks particularly for NSE workers that may be insufficiently covered (ILO, 2017). Tax-financed social protection schemes linked to residency are essential for the protection of those not covered by employment-based schemes. However, the adequacy of non-contributory benefits is often limited and may not be enough to maintain a decent living standard (Behrendt and Nguyen, 2018).

A risk of extending tax-financed benefits to other contingencies is the crowding-out of employer contributions. If benefits are no longer linked to employment, the challenge is how to ensure that employers continue to contribute (OECD, 2018b). Governments would also have to decide whether benefit entitlements are based on needs, for example by applying a means-test, or whether they are universal. Decoupling social protection from employment will further erode protection coverage and adequacy. Employers would be removed from their responsibility to contribute to their workers’ protection through the payment of social insurance contributions (Behrendt and Nguyen, 2018). If low coverage with social insurance has to be compensated with more tax-financed social assistance, social assistance schemes may become overburdened and

financially unsustainable. It would challenge the solidarity between contributors and beneficiaries.

Universal Basic Income

The concept of a universal basic income (UBI) dates back to the 18th century, when American philosopher and political activist Thomas Paine proposed to share government dividend with all citizens in the US, to compensate their loss to natural resources inheritance due to imposed land property laws (King & Marangos, 2016). More recently, the UBI emerged once again as a possible policy response to issues such as increasing inequality and future labour displacement due to automation. Some countries implemented pilot experiments to investigate how a UBI would affect employment, poverty, inequality and well-being of citizens. Finland, for example, conducted an UBI experiment with the unemployed in 2017-2018 (Kangas et al., 2019).

The basic idea of a UBI is to give each individual within the community or population an equal amount of income with no strings attached.⁵ Supporters of the UBI believe it to be a simple, transparent and cost-effective way to reform social assistance systems amid the increase in income equality (Colombino, 2019). The increased income in poor households would alleviate poverty, while the redistribution through the adoption of more progressive tax systems to fund the UBI would reduce inequality.

In its *2019 World Development Report*, the World Bank (2019) emphasises the need to expand social assistance programmes in developed countries. A UBI would increase the low poverty and unemployment benefit take-up rate, and it would provide protection to those workers who are currently not or insufficiently covered by social insurance schemes. A more universal social assistance system could tackle the challenges of “lack of awareness of benefits, misunderstanding of eligibility rules, the stigma associated with assistance, bureaucratic obstacles, and the opportunity costs of accessing benefits among beneficiaries” (World Bank, 2019:108).

There are various gradations as to the universality of policy proposals linked to the UBI discussion. Michal Rutkowski, Senior Director for Social Protection and Jobs at the World Bank, suggested in a blog post that there are different policy options to expand social assistance programme, such as means-tested Guaranteed Minimum Income (GMI) programmes or a Negative Income Tax schemes (Rutkowski, 2018). On the other end of the spectrum is the UBI, which is presented in the *WDR 2019* as the optimal policy for poverty reduction. The money transferred to the rich would be recovered by a progressive tax. With respect to Europe, the report estimates that additional funding requirements would be limited if the UBI is to replace all other cash transfer programmes. It would include the removal of all tax allowances and the taxing of UBI incomes (World Bank, 2019).

In between the two extremes described above, is Atkinson’s proposal. In his book *Inequality – What can be done* (Atkinson, 2015), he proposed a taxable universal child benefit and a participation income to expand the current social assistance coverage in developed countries. The argument for the former is that child poverty is on the increase and lack of resources at an early age lead to a greater distance from a decent living standard in adulthood, particularly in the current era when labour markets are education and skills biased. The participation income (PI) is

⁵ Children might receive an adjusted amount to account for different needs.

a form of universal basic income for adults, with broad eligibility conditions: any resident with civil engagement (paid or unpaid) or performing household duties would be eligible. Unlike the World Bank, Atkinson proposed the PI as complementary to current social protection systems. However, the PI would be taken into account for the assessment of income-related or social insurance-based benefits. Atkinson argues that the PI is a much simpler benefit. It would cover all in need, except those who “surf all day in Malibu” (Atkinson, 2015:221, quoting Rawls (1988)). Similar to a full-fledged UBI, funding would be derived from a much more progressive tax on wealth and property, which has additional redistributive effects.

A UBI is not by definition a Pareto-efficient⁶ or equity-enhancing solution. A UBI would create winners and losers, depending on its design and funding principles (World Bank, 2019). If the funding for the UBI is transferred from existing benefits, previous beneficiaries may experience significant income losses (Martinelli, 2017).

Critics of the UBI argue that it would change labour market participation. The Alaskan case of citizen dividends shows that the amount of working hours could decrease as some groups (for example, mothers with small children, students) switch from full-time to part-time employment (Feinberg & Kuehn, 2018; Jones & Marinescu, 2019). Yet, the overall effects are modest or negligible. The much-discussed Finland pilot, which run from 2017 to 2018, was intended to understand the effect of an UBI on unemployed groups. Preliminary results show that the programme had no effect on the employment rate, but that it led to an improvement in general mental well-being (Kangas, Jauhiainen, Simanainen, & Ylikännö, 2019). Cowan (2017), however, argues that these labour incentive studies have not considered the disincentive effect from the possible increase in income tax rates and may have underestimated the effect. Some argue that a UBI may also incentivise employers to reduce wages as the government already provides part of the income. However, a study from the 1970s Canadian UBI experiment in the area of Dauphin shows the opposite. The comprehensive guaranteed income implemented at that time pulled wage rates up by a considerable amount as it gave workers more bargaining power (Calnitsky, 2018).

The idea of a UBI sounds unrealistic to many given the funding requirements. But as Van Parijs (2004) observes, the question ‘is a basic income affordable?’ is too fuzzy. Affordability depends on the actual design and whether affordability is assessed given the current fiscal abilities or with the possibility of tapping into new funding sources. However, increasing tax rates to finance a UBI is considered politically difficult. Put simply by Martinelli (2017:8): “an affordable basic income would be inadequate and an adequate basic income would be unaffordable”. An equilibrium is probably hard to find. “[T]here is no such thing as a preferred basic income scheme independent of the overall institutional and policy context.” (De Wispelaere & Stirton, 2004:273). The details in the design of a UBI and the specific country context are two important elements in assessing the effectiveness and viability of such schemes.

Active labour market policies and retraining

While it is important to invest in safety nets, governments should also help people to acquire the right type of skills to navigate through an ever-changing labour market, either by investing in

⁶ No one can be made better off without another person being worse off.

formal education or by creating new training programmes (OECD 2017). Indeed, similar to employment forms becoming more diverse, the skills needed for the successful participation in the labour market are changing rapidly in line with the advancements in technology. According to McKinsey (2017), about 14% of the global workforce may have to switch occupations in the coming years. Companies will require different skill sets, which has implications for the individual worker (Illanes et al., 2018). Some skills such as digital ones seem to be of increasing importance due to the growing demand for ICT specialist (OECD, 2017). Others - such as soft skills - e.g. communication, team working, problem-solving – are not only less affected by automation but also increasingly rewarded by labour market (Deming, 2017). The question is who should take the lead in training, re-skilling and up-skilling the labour force.

Governments should invest much more in education than in the past. In particular, they are called to upgrade national education institutions not only by removing barriers and disparities but also by reforming current curricula in order to better promote the development of numeracy, social and communication skills and to meet the demand for new skills (Acemoglu, 2019).

Governments are also required to make labour market interventions more proactive. In such a setting, the ILO's report of the Global Commission on the Future of Work recommends the implementation of a universal lifelong learning approach as a way to cope with the changing nature of work offering “a pathway to inclusion in labour markets for youth and the unemployed” (ILO 2019: 30)⁷. The implementation of lifelong learning systems is also recommended by the OECD (2017) with the objective “...to permit adults to regularly update, upgrade, and sometimes even acquire completely new knowledge, skills and competences in order to stay employed and/or find new employment. Given that low-skilled workers are likely to bear the brunt of adjustment costs, efforts should be targeted on them, as well as on small- and medium-sized enterprises which tend to face greater barriers to investments in training” (OECD, 2017:19).

Governments should also promote youth employment opportunities by introducing employment programmes and supporting entrepreneurs. The private sector could contribute to increase youth employability offering quality apprenticeships and their first entry-level job. This is deemed particularly important for the NEET youth (not in employment or education) to prevent long-term unemployment and social exclusion (ILO, 2019). For older workers, apart from lifelong learning, the ILO's (2019) report of the Global Commission on the Future of Work suggests to provide more flexible working arrangements (both in terms of working hours and locations), partial retirement policies or raising optional retirement age. This could possibly help to alleviate pressure on current social protection systems due to aging demographics, change in the nature of work and reduced returns on pension investments.

Overall, these interventions are intended to improve workers' employability but also to expand the set of job opportunities. They are expected to mitigate social and economic costs associated

⁷ “Lifelong learning encompasses formal and informal learning from early childhood and basic education through to adult learning, combining foundational skills, social and cognitive skills (such as learning to learn) and the skills needed for specific jobs, occupations or sectors. Lifelong learning involves more than the skills needed to work; it is also about developing the capabilities needed to participate in a democratic society” (ILO, 2019: 30).

to the 4th industrial revolution including misallocation of human capital, reduction in productivity and increase in unemployment.

However, providing retraining and new job opportunities will be a critical challenge for many governments. The ILO's (2019) report of the Global Commission on the Future of Work highlights that the implementation and development of high-quality lifelong learning systems call for a close collaboration of governments, education institutions as well as firms. On the one hand, governments are expected to redesign and adapt employment services and training systems to the changing nature of work. To assist workers in transitioning in the labour market, governments are suggested to invest more in public employment services (PES) (ILO 2019). The focus of the improvements in PES should be increasing labour market information and personalised counselling and job matching. The reform of labour market institutions could be further facilitated by the use of new digital technologies which help to overcome constraints, such as accessibility, by providing more flexible solutions through, for example, online trainings.

On the other hand, firms, together with labour unions, are expected to play a leading role in the definition of the new skills required by the market (ILO, 2019). Employers might also have to take a larger role providing workers with opportunities to upgrade their skills (Barr, 2018). In the context of NSE arrangements, the responsibility of training and skills development has shifted from the firm to the individual worker. The increase in the share of NSE in a firm tends to decrease the firm's investment in training of its employees (George and Chattopadhyay, 2015). Firms switched from training of new skills to hiring for skills. Yet, given the increasing shortage of 'new' skills, this approach eventually limits the firms' response to changing markets (George and Chattopadhyay, 2015). Given the challenge ahead, the awareness that firms also have a responsibility in retraining and upskilling their employees is rising (Illanes et al., 2018). Based on a global survey with close to 300 executives from large companies (over USD 100 million in annual revenues), "addressing potential skills gaps related to automation/digitization" is considered a top-ten priority by 66% of the respondents (Illanes et al, 2018:2). Sixty four percent of the US executives and 59% of the executives surveyed in Europe "...believe that corporations, not governments, educators, or individual workers, should take the lead in trying to close the looming skills gap" (Illanes et al., 2018:3). Yet, a large majority does not feel to be prepared to close the gap, as companies themselves struggle in identifying how jobs will change and what skills will be needed in the coming years (Illanes et al., 2018).

Financing new social protection policies

The increase in NSE and the concurrent decrease in social insurance coverage of workers engaged in NSE has direct consequences for the financing of social protection mechanisms. Social insurance contributions go down and if NSE work results in lower wages, it has direct implications for income tax revenues required for tax-financed social protection. At the same time, due to more precarious work arrangements the need for social protection may increase. Hence, the ongoing transformation of work also requires a reconsideration of financing social protection in the future to achieve universal social protection.

Irrespective whether social insurance coverage is extended to NSE workers or whether social assistance programme are expanded with universal benefit schemes, extra funding would be needed for such reforms. The three main avenues for the creation of fiscal space in advanced

economies are (i) to re-allocate within current social protection budgets and/or other public expenditures, (ii) to increase current taxes and contributions, or (iii) to introduce new taxes. This section mainly focuses on the latter two points.

Most commentators agree that expanding the tax and contribution base is key for the sustainable financing of social protection systems. Behrendt and Nguyen (2018) argue that social insurance should remain the major funding form for workers' social protection and that increasing social insurance coverage to cover all forms of employment may reduce the social burden on tax-financed social assistance programmes. The OECD also recommends a broader coverage of NSE workers in terms of both social protection benefits and tax registration to balance the budgets (OECD, 2019b). As for the wider coverage and improved adult skills training system, it suggests a tri-partite financing scheme, which involves both tax funding, employers' contribution and employees' contribution.

Atkinson, with his proposal for a universal child benefit and participation income, suggests changing the current tax systems.⁸ He proposes “a more progressive rate structure for the personal income tax, with marginal rates of tax increasing by ranges of taxable income, up to a top rate of 65 per cent for the richest 1%, accompanied by a broadening of the tax base” (Atkinson, 2015:188). His goal is not only to increase government revenue for a broader social protection system, but also to decrease inequality between top earners and low-income households. Similarly, Piketty et al. (2014) propose a tax rate of around 80% for the top earners (starting from 57% to up to 83%). In his *Capital in the Twenty-First Century*, Piketty (2014) suggests a progressive tax on capital set at global level as an ideal tool to reduce inequality and to promote redistribution. Both Atkinson (2015) and Piketty (2014) provide a valid point when arguing for an intensification of the progressivity in taxation. Better-tailored taxation systems, in which those benefitting disproportionately from technology advancement are taxed more, will enable countries to better redistribute gains.

With regard to private sector companies, Ernst et al. (2018) suggest taxing superstar firms, such as technology companies, which gain the most in the current era. This will address income/wealth inequality brought about by technological change and provide financial support to a higher coverage social protection system. The beauty of platform work is also that all transactions are registered online. This property could be utilised for the collection of taxes and social contributions. Online platforms could be asked to share information on payments or to withhold taxes directly. The latter could be challenging if the firm is located in another country than the platform worker and would require cross-country agreements (OECD, 2018). Indeed, globalisation has made taxing these multinational companies increasingly difficult. In this regard, Zucman (2018) provides an interesting solution arguing that it is still possible to tax multinational firms.⁹ His proposal is to make corporate income tax inelastic “by apportioning the global, consolidated profits of firms proportionally to where they make their sales” (Zucman 2018:4). This solution should reduce or even stop the process of “profit shifting” since firms cannot move customers; moreover, it should end the delocalisation process because it will be no

⁸ Note that his discussion mainly focuses on the UK.

⁹ As reported by Zucman (2018: 2): “40% of multinational profits are shifted to tax havens each year globally and the United States loses about 15% of its corporate income tax revenue because of this shifting”.

longer relevant where the product is made. This would not even require an international agreement although it is always preferable.

All these policy recommendations provide a valid point when arguing for an intensification of the progressivity in taxation both on income and capital. Better-tailored taxation systems, in which those benefitting disproportionately from technology advancement and economic advancements are taxed more, will enable countries to better redistribute gains. Other suggestions on promoting tax revenue mobilisation include increasing inheritance and wealth taxes (UNCTAD, 2017; Behrendt and Nguyen, 2018), property taxes in large cities or increasing indirect taxes on goods with negative externalities such as taxes on sugar, tobacco, taxes on luxury goods and carbon taxes (World Bank 2018).

An alternative and controversial proposition which has found space in the academic literature and also in the public debate (Shiller, 2017) is the taxation of robots or their usage, which is summarised in the work by Guerreiro, Rebelo and Teles (2017). Microsoft founder Bill Gates was one of the first to call for the taxation of robots, but the opposition is fierce (The Economist, 2017). The two key potential benefits arising from such a measure would be of primary importance for the social protection implications of innovation. Firstly, taxation would permit to slow down the disruptive process of technologies, giving time to the market to adjust to the shock and avoid mass unemployment; secondly, it would permit to boost revenue collection for the funding of social and labour market interventions, possibly providing a direct source for a UBI. However, several arguments have been made against the possibility of a tax on robots, both from the political, managerial and academic world. For instance, the EU Commissioner for the Digital Single Market opposed the policy in order not to hamper Europe's competitiveness (Euractiv, 2017) and favours investments in re-skilling and upskilling of workers (Ansip, 2017). Others argue that without joint and mutually agreed global policies, it is possible that firms will relocate production to other countries opting for less stringent regulations (Summers, 2017). Moreover, the European Parliament rejected a proposal to robot tax for supporting or up-skilling displaced workers in 2017 (Reuters, 2017). In a press release issued around the same time, the International Federation of Robots is also against the idea as it would increase the cost of investment in technology and may dampen further development (IFR, 2017). Considering the mixed evidence regarding the actual role of machines in the replacement of human labour, it may be argued that the call for drastic regulation should not be a matter of primary concern. Nevertheless, the debate on robot taxation requires more in-depth analysis and further research.

Conclusions

During the twentieth century, public policies were instrumental in confining economic and social inequalities in Europe with education, labour rights and tax and transfer policies. Social insurance systems were built on the premise of risk sharing among workers that are permanently employed and with a relatively stable income (Barr, 2018). Stepping into the twenty-first century, however, we see the increasing displacement of routine workers by automated machines and the rise of NSE. European welfare states are not well prepared for these changes. Part-time, temporary or platform workers still earn an income, but they miss the benefits linked to full-time employment

(Bussolo et al., 2019). As a result, NSE workers have a higher likelihood of falling into poverty in the event of a shock, such as illness, disability, maternity or retirement.

Both firms and workers benefit from new technologies as they lower transaction costs and offer flexibility in working arrangements. This flexibility could also be turned into precarity and insecurity for workers, as they may no longer rely on the protective function of social insurance mechanisms (OECD, 2018). It is questionable whether the benefits in terms of more flexibility weigh out against these costs.

Hence, there is a need to update current social protection systems in order to become truly universal including all irrespective of their level and type of employment. There is no easy fix given the diversity of employment and different countries have different preferences regarding the size of the welfare state. Yet, concluding from the above discussions, future social protection system reforms in developed countries should share the following common ideas:

1. Strengthen and extend social insurance with flexibility and versatility. Contributory social security schemes should be designed based on the existing labour market structure. As employment forms and career paths become increasingly diversified, these important risk-sharing schemes should respond by evolving into versions that are more flexible. Rigid schemes with eligibility criteria in terms of continuous working hours or contributions would exclude NSE workers from social protection and contributions (Eichhorst et al., 2017).

2. Increase individualised elements while not neglecting the solidarity of social security. As discussed above, untying contributions from employment relations may be a policy option to provide better coverage to self-employed, temporary workers or gig workers. However, individual accounts may undermine the risk sharing purpose of social security and eventually shift the risk-bearing back to the workers (OECD, 2018b).

3. Labour laws and social security reform are needed to prevent the further casualisation of jobs, particularly at the convenience of online platforms or gig economy. Equal treatment of self-employed workers and wage workers, clear employment classification for platform workers and restrictions on NSE, for example, are some policies to be considered to prevent the commodification of work and provide sufficient protection and thus dignity to workers of all forms (ILO, 2017).

4. Explore possibilities in extending existing social protection floors. There is a wide range of options from relatively narrow tax-financed non-contributory schemes to a full-fledged UBI. Any reform needs to be carefully designed, taking into account the local context and political and social preferences in order not to jeopardise the solidarity between contributors and non-contributors in society. In the European context, closer ties and cooperation among countries is essential in securing tax income and reducing tax evasion (World Bank, 2019)

5. Invest more in education and make labour market policies more proactive. In particular, governments are expected to reform curricula to meet the demand for new skills and to invest in lifelong learning systems. These interventions are intended to prepare for the possible shock of substantial work displacement but also and most importantly to improve workers' employability and expand the set of job opportunities. In such a setting, governments will also benefit from the

technological improvements and avoid misallocation of human capital, reduction in productivity and increase in unemployment. Likewise, the private sector needs to step up and take its own responsibility in training their employees for the future.

At a time of rapid innovation, governments need to be just as innovative in order to ensure the continued well-being of their citizens. "... [T]he future of the welfare state depends not only on economic feasibility, but also very much on what people, through the political process, decide that they want" (Barr, 1998:414).

References

- Acemoglu, D. (2019). It's Good Jobs, Stupid. *Policy Brief* 13. Available at <https://econfip.org/#>
- Acemoglu, D., & Autor, D. H. (2011). Skills, Tasks and Technologies: Implications for Employment and Earnings. In *Handbook of Labor Economics*. Vol. 4, 1043-1171. Elsevier.
- Acemoglu, D., & Restrepo, P. (2017). Robots and Jobs: Evidence from US Labor Markets. *NBER Working Paper*, 23285. National Bureau of Economic Research.
- Annunziata, M., & Bourgeois, H. (2018). The future of work: how G20 countries can leverage digital-industrial innovations into stronger high quality jobs growth. *Economics: The Open-Access, Open-Assessment E-Journal*, 12(2018-42), 1-23.
- Ansip, A. (2017). Making the most of robotics and artificial intelligence in Europe. Blog Post. 17 November 2017. https://ec.europa.eu/commission/commissioners/2014-2019/ansip/blog/making-most-robotics-and-artificial-intelligence-europe_en
- Arntz, M., Gregory, T., & Zierahn, U. (2016). The risk of automation for jobs in OECD countries. *OECD Social, Employment and Migration Working Papers* No. 189.
- Atkinson, A. B. (2015). *Inequality: What can be done?* Harvard University Press.
- Autor, D. H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives*, 29(3), 3-30.
- Autor, D. H., & Dorn, D. (2013). The Growth of Low-Skill Service Jobs and the Polarization of the US Labor Market. *American Economic Review*, 103(5), 1553-1597.
- Barr, N. (1998). *Economics of the welfare state* (1998 ed.) Oxford University Press.
- Barr, N. (2012). *Economics of the welfare state*, 5th edition. Oxford University Press.
- Barr, N. (2018). Shifting Tides. FINANCE & DEVELOPMENT
- Basu, A. K., Chau, N. H., & Soundararajan, V. (2016) Wage Polarization and Contract Employment. Available at: http://jobsanddevelopmentconference.org/wp-content/uploads/2016/10/CHAU_wage-polarization-and-contract-employment.pdf
- Behrendt, C., & Nguyen, Q. A. (2018). Innovative approaches for ensuring universal social protection for the future of work. *ILO Future of Work Research Paper Series* No. 1.
- Bonoli, G. (2016). Europe's Social Safety Net Under Pressure. *Current History*, 115(779), 102-107.
- Bussolo, M., Checchi, D., & Peragine, V. (2019). *Long-term evolution of inequality of opportunity*. The World Bank.
- Buschoff, K. S., & Protsch, P. (2008). (A-)typical and (in-)secure? Social protection and "non-standard" forms of employment in Europe. *International Social Security Review*, 61(4/2008).
- Calnitsky, D. (2018). The employer response to the guaranteed annual income. *Socio-Economic Review*
- Clifford, C. (2016). *Elon Musk: Robots will take your jobs government will have to pay your wage* [Video]. US: CNBC
- CNBC. (2016). *Elon Musk: Robots will take your jobs government will have to pay your wage*.
- Codagnone, C., Lupiáñez-Villanueva, F., Tornese, P., Gaskell, G., Veltri, G., Vila, J., ... Fana, M. (2018). Behavioural Study on the Effects of an Extension of Access to Social Protection for People in All Forms of Employment.
- Colombino, U. (2019). Is unconditional basic income a viable alternative to other social welfare measures?. *IZA World of Labor*.
- Cowan, S. (2017). *UBI—Universal Basic Income is an Unbelievably Bad Idea*.
- Deming, D.J. 2017. The Growing Importance of Social Skills in the Labor Market. *The Quarterly Journal of Economics*, 132(4), 1593-1640.
- De Stefano, V. (2016). The rise of the "just-in-time workforce": On-demand work, crowdwork and labour protection in the "gig-economy". *Conditions of Work and Employment Series* No. 71. International Labour Office
- De Wispelaere, J., & Stirton, L. J. (2004). The Many Faces of Universal Basic Income. *The Political Quarterly*, 75(3), 266-274

- Dobbs, R., Manyika, J., & Woetzel, J. (2015). The four global forces breaking all the trends. *McKinsey Global Institute*, 1-5.
- Eichhorst, W., Marx, P., & Wehner, C. (2017). Labor market reforms in Europe: towards more flexible labor markets? *Journal for Labour Market Research*, 51(1), 3.
- Ernst, E., Merola, R., & Samaan, D. (2018). The economics of artificial intelligence: Implications for the future of work. *ILO Future of Work Research Paper Series No. 1*.
- Esping-Andersen, G. (1990). *The Three Worlds of Welfare Capitalism*. Polity Press.
- Euractive (2017) MWC17: The power behind the tech revolution. Special Report 27 Feb - 3 Mar 2017. <http://eurac.tv/6MC7>
- European Commission. (1999). *Transformation of labour and future of labour law in Europe*.
- Eurostat (2019). *Hourly Labour Costs*. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php/Hourly_labour_costs#Non-wage_costs_highest_in_France_and_Sweden
- Feinberg, R. M., & Kuehn, D. (2018). Guaranteed Nonlabor Income and Labor Supply: The Effect of the Alaska Permanent Fund Dividend. *The B.E. Journal of Economic Analysis & Policy*, 18(3).
- Ford, M. (2015). *Rise of the Robots: Technology and the Threat of a Jobless Future*. Basic Books.
- Fortson, D. (2018, April 15). Robots will take most jobs, predicts Bill Gates. *The Times*. Retrieved from <https://www.thetimes.co.uk/article/robots-will-take-most-jobs-predicts-bill-gates-nt9jzg2c5>.
- Frey, C. B., & Osborne, M. A. (2013). The Future of Employment: How Susceptible are Jobs to Computerisation?. *Technological forecasting and social change*, 114, 254-280.
- Fultz, E. (2011). *Pension Crediting for Caregivers: Policies in Finland, France, Germany, Sweden, the United Kingdom, Canada, and Japan*. Institute for Women's Policy Research.
- George, E., & P. Chattopadhyay (2015). Non-standard work and workers: Organizational implications. *Conditions of Work and Employment Series*, No. 61. International Labour Organisation.
- Goldin, C., & Katz, L. F. (2007). *The Race between Education and Technology: The Evolution of U.S. Educational Wage Differentials, 1890 to 2005* (No. w12984). National Bureau of Economic Research.
- Goolsbee, A. (2018). *Public Policy in an AI Economy*. (No. w24653). National Bureau of Economic Research.
- Goos, M. & Manning, A. (2003). Lousy and Lovely Jobs: The Rising Polarization of Work in Britain. *Center for Economic Performance Discussion Papers*, DP0604.
- Goos, M., Manning, A., & Salomon, A. (2009). *Explaining Job Polarization in Europe: The Roles of Technology, Globalization and Institutions*. (No. dp1026). Centre for Economic Performance, LSE.
- Graetz, G., & Michaels, G. (2015). Estimating the impact of robots on productivity and employment. Center for Economic Performance. <http://cep.lse.ac.uk/pubs/download/dp1335.pdf>.
- Guerreiro, J., Rebelo, S. & Teles, P. (2017). Should Robots be Taxed?. *NBER Working Papers* 23806. National Bureau of Economic Research.
- Hinrichs, K. & Jessoula, M. (2012). Labour Market Flexibility and Pension Reforms: What Prospects for Security in Old Age?. In: Hinrichs K., Jessoula M. (eds) *Labour Market Flexibility and Pension Reforms. Work and Welfare in Europe*. Palgrave Macmillan, London.
- Illanes, P., Lund, S., Mourshed, M., Rutherford, S., & Tyreman, M. (2018). *Retraining and reskilling workers in the age of automation*. McKinsey & Company.
- IFR. (2017). World Robotics Federation IFR: Why Bill Gates' robot tax is wrong. Press Release. International Federation of Robotics. Retrieved from: <https://ifr.org/ifr-press-releases/news/world-robotics-federation-ifr-why-bill-gates-robot-tax-is-wrong>
- ILO. (2016). *Non-standard employment around the world: Understanding challenges, shaping prospects*. International Labour Organization.

- ILO. (2017). *World Social Protection Report 2017-19: Universal Social Protection to Achieve the Sustainable Development Goals*. International Labour Organization
- ILO. (2018). Public employment services: Joined-up services for people facing labour market disadvantage. *ILO Briefs on Employment Services and ALMPs*, No. 1. International Labour Organisation.
- ILO. (2019). *Work for a brighter future – Global Commission on the Future of Work*. International Labour Organisation.
- ILO & World Bank. (2015). *Joint Statement by World Bank Group President Jim Yong Kim and ILO Director General Guy Ryder*. Retrieved from <http://www.worldbank.org/en/news/press-release/2015/06/30/joint-statement-world-bank-group-president-ilo-director-general-guy-ryder>
- International Federation of Robotics. (2018). *The Impact of Robots on Productivity, Employment and Jobs*.
- Jones, D., & Marinescu, I. (2019). The Labor Market Impacts of Universal and Permanent Cash Transfers: Evidence from the Alaska Permanent Fund. *NBER Working Paper*, 24312. National Bureau of Economic Research.
- Julià, M., Vanroelen, C., Kim, B., Van Aerden, K., & Benach, J. (2017). Precarious Employment and Quality of Employment in Relation to Health and Well-being in Europe. *International Journal of Health Services*, 47(3).
- Kangas, O., Jauhiainen, S., Simanainen, M., & Ylikännö, M. (2019). *The basic income experiment 2017–2018 in Finland. Preliminary Results*. Retrieved from Ministry of Social Affairs and Health website: <http://urn.fi/URN:ISBN:978-952-00-4035-2>
- Katz, L. F., & Margo, R. A. (2014). Technical Change and the Relative Demand for Skilled Labor: The United States in Historical Perspective. In *Human capital in history: The American record* (pp. 15 – 57). University of Chicago Press.
- Keynes, J. M. (1930). Economic Possibilities for our Grandchildren. In *Essays in Persuasion* (pp. 358–373).
- King, J. E., & Marangos, J. (2016). Two arguments for Basic Income: Thomas Paine (1737-1809) and Thomas Spence (1750-1814). *History of Economic Ideas*, 55–71.
- Lasi, H., Kemper, H.-G., Fettke, P., Feld, T., & Hoffmann, M. (2014). Industry 4.0. *Wirtschaftsinformatik*, 56(4), 261–264.
- Loprest, P., & Nightigale, D. (2018). *The Nature of Work and the Social Safety Net*. Urban Institute.
- Ludicone, F., & Arca Sedda, A. (2015). *Italy: Reforms to system of unemployment benefits*. Eurofund. Retrieved from: <https://www.eurofound.europa.eu/it/publications/article/2015/italy-reforms-to-system-of-unemployment-benefits>
- Manyika, J., Lund, S., Bughin, J., Robinson, K., Mischke, J., & Mahajan, D. (2016). *Independent Work: Choice, Necessity, and the GIG Economy*. McKinsey Global Institute.
- Martinelli, D. L. (2017). *Exploring the Distributional and Work Incentive Effects of Plausible Illustrative Basic Income Schemes*. IPR, Institute for Policy Research.
- Matthews, D. (2018). *The amazing true socialist miracle of the Alaska Permanent Fund*. Vox. Retrieved from: <https://www.vox.com/policy-and-politics/2018/2/13/16997188/alaska-basic-income-permanent-fund-oil-revenue-study>
- McKinsey Global Institute. (2017). *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation*.
- National Domestic Workers Alliance. (n.d.). National Domestic Workers Alliance - Benefits
- Nedelkoska, L., & Quintini, G. (2018). Automation, Skill Use and Training. *OECD Social, Employment and Migration Working Papers*, No. 202. OECD.
- Nomaler, Z. O., & Verspagen, B. (2018). Perpetual growth, distribution, and robots. *UNU-MERIT Working Papers*, No. 2018-023). Maastricht University.
- OECD (2015), *In It Together: Why Less Inequality Benefits All*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264235120-en>.

- OECD. (2017). *Future of Work and Skills*. Presented at the 2nd Meeting of the G20 Employment Working Group, Hamburg.
- OECD. (2018a). *OECD Employment Outlook 2018*.
- OECD. (2018b). *The future of social protection. What works for non-standard workers*.
- OECD. (2019a). *OECD Employment Outlook 2019*.
- OECD. (2019b). *Policy Responses to New Forms of Work*.
- OECD. (2019c). *Taxing Wages 2019*. OECD Publishing, Paris.
- Piketty, T. (2014). *Capital in the Twenty-First Century*. Cambridge, MA: Harvard University Press
- Piketty, T., Saez, E., & Stantcheva, S. (2014). Optimal taxation of top labor incomes: A tale of three elasticities. *American Economic Journal: Economic Policy*, 6(1), 230-71
- Pinelli, D., Torre, R., Pace, L., Cassio, L., & Arpaia, A. (2017). The Recent Reform of the Labour Market in Italy: A Review. *European Economy Discussion Paper*, 72. European Commission.
- PWC. (2018). *Will robots really steal our jobs? An international analysis of the potential long term impact of automation*. PWC.
- Reuters (2017). *European Parliament calls for robot law, rejects robot tax*. Retrieved from: <https://www.reuters.com/article/us-europe-robots-lawmaking/european-parliament-calls-for-robot-law-rejects-robot-tax-idUSKBN15V2KM>
- Rutkowski, M. (2018, August 24). *A glimpse into the future of social protection*. Retrieved December 4, 2019, from Let's Talk Development website: <http://blogs.worldbank.org/developmenttalk/glimpse-future-social-protection>
- Schoukens, P., Barrio, A., & Montebovi, S. (2018). The EU social pillar: An answer to the challenge of the social protection of platform workers? *European Journal of Social Security*. 20(3), 219-241.
- Schumpeter, J. A. (1942). *Socialism, Capitalism and Democracy*. Harper and Brothers.
- Shiller, R. (2017). Why robots should be taxed if they take people's jobs. *The Guardian*. Retrieved from: <https://www.theguardian.com/business/2017/mar/22/robots-tax-bill-gates-income-inequality>
- Spasova, S., Bouget, D., Ghailani, D., & Vanhercke, B. (2017). *Access to social protection for people working on non-standard contracts and as self-employed in Europe: A study of national policies*. European Social Policy Network (ESPN), Bruxelles, Commission européenne.
- Summers, L (2017). Picking on robots won't deal with job destruction. Opinions. *The Washington Post*, 5 March 2017.
- Tessier, L., Schwarzer, H., Stern Plaza, M. (2013). Multinational enterprises' engagement in extending social security: examples of practices and challenges. *ESS Working Paper*, No. 43. International Labour Organisation.
- The Economist (2017). *Why taxing robots is not a good idea*. February 25th, 2017. <https://www.economist.com/finance-and-economics/2017/02/25/why-taxing-robots-is-not-a-good-idea>
- Torry, M. (2016). *Citizen's Basic Income: A Christian Social Policy*. Darton, Longman & Todd Limited.
- Valenduc, G., & Vendramin, P. (2016). *Work in the digital economy: sorting the old from the new*. Working Paper, 2016.03. Brussels: European Trade Union Institute.
- Van Parijs, P. (2004). Basic income: a simple and powerful idea for the twenty-first century. *Politics & Society*, 32(1), 7–39.
- Vermeulen, B., Kesselhut, J., Pyka, A., & Saviotti, P. P. (2018). The Impact of Automation on Employment: Just the Usual Structural Change? *Sustainability*, 10(5), 1661.
- Westerveld, M. (2012). The 'new' self-employed: an issue for social policy? *European Journal of Social Security*, 14(3), 156–173.
- World Bank. (2019). *World Development Report 2019 - The Changing Nature of Work*. Zucman, Gabriel. 2014. "Taxing Across Boarder: Tracking Personal Wealth and Corporate Profits", *Journal of Economic Perspectives*, 28(4): 121-148.

Annex: Country examples

Social Protection Toolbox	Policy Target	Programmes	Support	Criticism
Italy				
Social insurance	Include self-employed and disguised self-employed in social insurance	Act No. 81/2017 and DIS-COLL Imposed in 2017, the act includes professional and dependent self-employed workers to the DIS-COLL, a specific unemployment benefit for self-employed workers. It provides income support for up to six months in case of unemployment, based on social security contributions (minimum 3 months of contributions in the calendar year prior to the year of dismissal, plus 1 month in the same year) and earnings.		
	Reduce contribution years and amount to include more NSE workers	New Social Insurance Provision for Employment (NASpI) Imposed in 2015, it reduces the eligibility to unemployment benefits from 12 months of social contributions in the 2 years preceding unemployment, to 13 weeks of social contributions in the 4 years and at least 30 working days in the 12 months before termination of employment.	The system is overall more generous in coverage and benefit in general. It also harmonises the different eligibility requirements and durations in the previous ASPI and MiniASPI programmes for different workers. (Pinelli, Torre, Pace, Cassio, & Arpaia, 2017)	Italian General Confederation of Workers (CGIL), criticised the new benefit is not truly universal and failed to cover quasi-subordinate workers and seasonal workers. Right-wing politicians suggests the scheme is not financially sustainable. (Ludicone & Arca Sedda, 2015)
Finland				
Social Assistance	Universal Cash Transfer	Universal Basic Income Experiment 2017 – 2018 Implemented by Kela, the Social Insurance Institution of Finland, 2,000 people aged 25-58 who were originally receiving unemployment allowance were selected to participate in the experiment. They received 560 Euros per month, no matter they could find work or not during that period.	Preliminary results show participants have a better subjective well-being during the experiment. (Kangas et al., 2019)	Preliminary results show the basic income did not increase participants' working hours or working income. It has no observable changes on employment. (Kangas et al., 2019)

Netherlands				
Social insurance	Includes part-time workers into insurance scheme	Part-time workers are entitled to the same wages, benefits and training opportunities as full-time employees legally.	Part-time workers enjoy comparable conditions to full-time employees, making it a more level playing field for employers and workers. (Behrendt & Nguyen, 2018)	Precarious groups of on-call workers or zero-hour workers may not be included due to their irregular or insufficient working hours. (Behrendt & Nguyen, 2018)
Denmark				
Social insurance	Reduce requirements on continuous contribution in unemployment benefits	Recipients for unemployment benefits are required to contribute to the insurance for at least 12 months/ 52 weeks spread over previous 36 months.	Temporary workers, or fixed-term contract workers with career breaks are also covered in unemployment benefits. (Behrendt & Nguyen, 2018)	
France				
Social insurance	Increase social insurance coverage on sectors that are predominantly self-employed	Intermittents du Spectacle A scheme for artists and technicians in entertainment industry. To qualify for unemployment benefits, only 507 hours of work in the last 12 months are required.	Include performers and stage technicians, who are often hired for short-term basis, for unemployment benefits. (OECD, 2018c)	Short contribution periods disincentivise workers for long-term employment. They could cycle back and forth between working for 3 months each year cycle and unemployment benefit receipt. (OECD, 2018c)
Labour policies	Protect platform workers in benefits and social insurance	Platform workers are considered as self-employed “artisans” or “traders”. They are subjected to special social insurance schemes. However, the online intermediating platforms have to cover the platform workers for their sick pay insurance. (Schoukens, Barrio, & Montebovi, 2018)		

Germany				
Social insurance	Recognise care work for children as contribution period	Pension credit points were awarded to any employed parent or non-employed parent who takes time off (maximum 3 years per child) to take care their children (below 10 years old) based on the average wage in the economy. The law also provides caregivers for disabled persons pension credit, without any time limit.	Germany requires five years of contributions to qualify for a pension, many mothers of two children can establish pension eligibility based on child-care pension credit alone and prevent them from falling into poverty in elderly. (Fultz, 2011)	Some argues this may disincentivise women from entering labour market. However, such trend is not observed. (Fultz, 2011) <i>Note: Similar pension credit programmes for care work are also found in Canada, Japan, Finland, Sweden, the UK and France</i>
	Increase social insurance coverage on sectors that are predominantly self-employed	Künstlersozialversicherung All performing artists, writers, and publicists on short-term contracts are covered through a specific social insurance. The scheme is funded with 3 sources: 1/ contribution from companies that make use of artistic services, 2/ workers' contributions if earnings are above a certain level, and 3/ a government subsidy.	Takes into account the characteristics of art and cultural sectors and provide tailor-made solutions to provide social insurance. (Behrendt & Nguyen, 2018)	Since workers only need to pay a minimum contribution according to their earnings and get a full coverage on health insurance and social security. The incentive to under-report earnings is high. (OECD, 2018c)
India				
Social Insurance	Increase coverage on casual workers	Worker Welfare Funds A statutory body created to provide workers with an old-age pension, employment injury protection, health insurance and maternity cash benefits for women. They are usually funded by a combination of worker contribution, a levy on construction project value and sometimes the state government.	The fund ensures the social security of casual workers in project-based sectors, such as construction and building services. (Behrendt & Nguyen, 2018)	The Funds are managed by individual state authorities, which have different contribution level and thus benefit adequacy. (Behrendt & Nguyen, 2018)
USA				
Social Insurance	Ensure self-employed are covered in social insurance	Self-employed are obliged to pay both employer's and employee's contribution to social security and health	Self-employed are mandatory to obtain	The self-employed may not be able to transfer the extra

		insurance.	social insurance and health insurance coverage.	contribution to a higher cost of his service due to market pressure. (OECD, 2018c)
	Increase NSE workers' coverage in insurance	National Domestic Workers Alliance Since 2018, the Alliance in the US collects contributions from clients to fund its self-employed members' injury/ sick insurance.	Self-employed domestic helpers and cleaners are covered with life insurance (National Domestic Workers Alliance, n.d.)	
Social Assistance	Universal Cash Transfer	The Alaska Permanent Fund A state-owned investment fund established since 1982 using oil revenues. An annual dividend is paid to every resident in Alaska. The amount is related to the oil prices in that year, ranging from USD\$800 to over USD\$2000 per person.	Although the amount is not sufficient for living wages in Alaska, it is sufficient to eradicate absolute poverty of USD\$2 per day per person in most years. (Matthews, 2018)	Hard to replicate as the fund is solely financed by natural resources provident.
Australia				
Labour policies	To protect casual workers from insufficient social insurance and other benefits	Casual loading Casual workers on short notice and have no paid holidays or sick leave are entitled to an extra 25% of hourly wage compared to a permanent worker on the same job.	The casual workers enjoy a seemingly higher wage than permanent workers to compensate their lack of benefits and social insurance. (OECD, 2018c)	The wage premium for casual workers is still modest and does not disincentivise employers from using this form of employment. (OECD, 2018c)

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