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ABSTRACT

Digital Challenges for the Welfare State

Digitalization is the buzzword under which profound changes of the labor market can be summarized. Next to automation, i.e., the increasing use of robots, "intelligent" machines and more comprehensive algorithms that is no longer restricted to routine tasks, especially the emerging platform economy may pose significant "digital challenges" for the welfare state. This article sheds light on the potentially eroding foundations of the welfare state, it discusses tools for combating a potential digital divide on the individual level, and it proposes a new institutional perspective on firms, workers, and the welfare state.

JEL Classification: J08, J24, O33, O38

Keywords: digitalization, robots, automation, future of work, industry 4.0, technological change, platform economy, welfare state

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1. Introduction

Many ongoing changes in the labor market can be summarized under the keyword "digitalization".[1] Although the risks associated with this process appear in general manageable and there is no reason to be overly concerned or even alerted (Eichhorst and Rinne, 2017), our world of labor is indeed changing to a substantial extent. Hence, there are a number of challenges associated with this process, for which it is reasonable to prepare in due course. Since digitalization is often very broadly defined, it appears useful to break down this process into its two main components (cf. Degryse, 2017).

The first component of digitalization may be labelled "automation". It comprises the increasing use of robots, machines and algorithms in value chains, which is moreover no longer restricted to simple routine tasks. Related to this component is the more general perspective on the future of work in light of technology-induced productivity growth, which focuses in particular on its potential impacts on aggregate (and occupation-specific) employment. Hence, the controversial debates about the "end of work" technological unemployment and polarization are also related (see, e.g., Eichhorst et al., 2017, for details). Representative for this strand of the literature, Autor and Salomons (2017) find that negative employment effects of productivity growth within industries have so far been offset by spillover effects in the rest of the economy. Aggregate demand has therefore been remarkable stable, and job losses have been outweighed by new employment opportunities. However, underlying employment shifts, mostly into tertiary services, are skill-biased and tend to polarize labor demand.

The second component of digitalization may be summarized under the label "platform economy". It refers to an entirely new business model that includes new real and virtual services and, importantly, online outsourcing. In fact, online outsourcing may be viewed as a new form of (digital) Taylorism, and the "crowd" may be viewed as a new player in the labor market (Degryse, 2017). Similar to developments during the industrial revolution, labor can once again be divided into its constituent parts – albeit

[1] Also globalization, demographic change, and changing values and attitudes towards work are important developments related to (and drivers of) ongoing changes in the labor market (see, e.g., BMAS, 2017).

this time, at least potentially, on a massive, virtual and global scale, where these constituent parts are moreover increasingly automated and connected flexibly to each other (Eichhorst et al. 2017).

Digitalization as a whole, but especially its second component – the platform economy – may lead to significant "digital challenges" for the welfare state. These challenges include the question of how the welfare state handles new social inequalities and a potential "digital divide", for example, by developing the individual skills and abilities that digitalization and future jobs require (Buhr et al., 2016, p. 4). But "digital challenges" also relate to the potentially eroding foundations and basic concepts on which the welfare state was historically built upon. Forward-looking policy responses, inter alia in the areas of taxation and social security, may therefore ultimately require a new institutional perspective on workers, firms, and the welfare state.

2. Eroding Foundations of the Welfare State

The entirely new business model of the platform economy blurs traditional definitions of the welfare state. For example, the categories of self-employed and dependent employees appear not sufficient to properly classify and treat platform workers, the concept of a "firm" cannot be easily applied to virtual companies that operate in the cloud, and also national and country-specific policy approaches are substantially challenged.

More specifically, standard employment relationships are fundamentally challenged by the platform economy – at least in areas where work does not require specific skills and can be sourced out easily. Following traditional categorizations, platform workers are usually classified as self-employed or freelancers, and they are therefore not covered to the same extent as dependent employees by social security, in particular social insurance. This spurs unfair competition with traditional workers, who no longer act on a level playing field. Perhaps the most prominent and often cited example is in the transport business, where Uber drivers compete with rather heavily regulated taxi drivers. In this context, for instance, it is not clear whether Uber should be considered a transport company or digital service – with

important implications for its workers.[2] Many self-employed and freelancers also lack appropriate pension insurance. If crowd-working is the main activity, the coverage and capacity to contribute to pension insurances and other types of social security is limited.[3] Under current circumstances, platform workers would thus be to a larger extent dependent on tax-financed basic welfare or social security.

Firms operating in the platform economy follow many different business models and only share some common features. This complicates applying a universal approach towards platform firms and platform workers. In many instances, platforms ultimately create their own "markets", and they also define the rules governing these markets. It appears at least to some observers as if "the platforms regulate the market" (see, e.g., Berg, 2016, p. 18). Platforms may regulate market entry, market transactions and data collection in a given market, which is in turn ultimately defined by the platforms themselves. This leads to unfair competition with traditional firms employing dependent employees, parallel labor markets, and an erosion of labor law. Many platforms can effectively externalize social security obligations to their workers, and a possible expansion of freelance work or self-employment could thus undermine the social security model. This has also to do with market structures, as the supply of digital online work usually exceeds its demand by far.

In addition, novel features which characterize the digital economy may lead to substantial challenges in the area of taxation, including an eroding tax base and profit shifting (Li, 2014). These features include strong reliance on intangible assets, massive use of data as a production factor, new business models, and the difficulty of determining the jurisdiction in which value creation occurs. While these challenges are actually not limited to the digital economy, they yet become much more acute. For example, Li (2014) refers to a tax "base cyberization" in this context, which adds to the existing problem of base erosion due to artificial tax planning structures.

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[2] See Schmidt-Drüner (2016, p. 6) who refer to a recent case in which a Spanish judge has submitted a preliminary question to the European Court of Justice. If Uber was considered a transport company, its drivers could for example (potentially) request the company to pay their insurance fees. But if Uber was considered a digital company, (national) regulations would be harder to apply.

[3] See Leimeister et al. (2016) for Germany and Berg (2016) for the United States.

The platform economy is global and (virtually) spans national borders, while its governing institutions are mostly national and historically rooted in country-specific contexts. Unilateral approaches are certainly not a solution, and thus not only Robertshaw et al. (2015, p. 79) identify a need for a global approach: "Global policy formulations are required in the collaborative economy because it operates on a global scale, regardless of national or regional borders."

Transforming the welfare state to match new realities of the digital era therefore requires appropriate responses on the individual and institutional level. It is, however, not trivial to solve the "digital challenges" without impeding digital growth. Any responses have to master a balancing act: On the one hand, they have to accommodate digital growth and promote the chances of digitalization, and on the other hand, it is essential to confine new social inequalities and to avert a potential digital divide.

3. Combating a Potential Digital Divide on the Individual Level

On the individual level, it appears crucial to combat a potential digital divide by adequately preparing workers for imminent changes. Labor markets will become more complex and more flexible, with profound impacts on employment forms, occupations, and skill requirements. In this context, the focus should be on education, training, and lifelong learning.

For instance, employment forms will change as flexible working times, working time accounts, and working mobile and working from home will become the norm rather than the exception (Eichhorst et al., 2017). An increasing scarcity of skilled labor, more competition and more innovation will pave the way for new and innovative work arrangements. Flexibility in working hours and workplaces will moreover blur the lines between private and working life, with both desirable effects (such as new opportunities to realize a better balance between professional and family life) and potential negative effects (such as excessive demands). But this also means that, for example, competencies such as self-management and self-organization will gain importance for a massive share of the population.

In addition, the traditional perspective on occupations will likely change. Already today more and more occupations share common sets of tasks, skills and competencies – almost independently of the specific job profile, sector or

industry. For example, almost every job requires at least some basic IT knowledge, and more and more jobs require also programming skills. This trend will likely continue, and it also reflects that data indeed become another main production factor in the digital economy (see, e.g., Li, 2014). A fresh perspective on occupations may therefore require to "unbundle" skills and qualifications, which means that vocational education and training systems will have to increasingly focus on providing specific skills in a very dynamic fashion over the entire course of a person's labor market career as to prepare individuals to learn and adapt more or less continuously rather than offering a predetermined and fixed set of skills (which is nowadays referred to as an "occupation") at the beginning of a person's working life.

With respect to the future of jobs and skills, there are two very popular, but also entirely different scenarios (see, e.g., Hirsch-Kreinsen, 2016). The first of the two scenarios, usually labelled as "polarization", offers a more pessimistic outlook with a growing gap between complex, high-skilled jobs on the one hand and simple, low-skilled jobs on the other hand. This growing gap is accompanied by a dramatic decline of jobs in the middle of the skills distribution in this scenario. In stark contrast, the second scenario offers a more optimistic outlook. Often referred to as "upgrading", the level of skills and qualifications is here assumed to rise across the entire distribution. The increasing use of robots, machines and algorithms would thus lead to an occupational upgrading and a specialization of workers in this scenario. Human labor would become more complementary to technology, more skill-intensive, but also potentially more rewarding for the individual.

It is, however, important to realize that these two different outlooks are just scenarios about future developments – reality might still be very different. For example, while a tendency towards employment polarization can be observed in a number of countries, this trend has been, at least so far, clearly less dramatic in Germany than in other European countries (Goos et al., 2014; Eurofound, 2015). In this context, it can be shown that Germany's dual apprenticeship system is related to less employment polarization (Rendall and Weiss, 2016). This proves once again that institutional settings, in this case especially in the area of education and training, can make a difference – also for the question whether or not a scenario of "upgrading" or a scenario of "polarization" is a more likely future outcome on the labor market.

What should thus be the appropriate policy responses in order to increase the chances of the "upgrading" scenario as a future outcome on the labor market? First of all, a general requirement for tomorrow's workforce is referred to as "upskilling" (European Commission, 2016). Qualification requirements will most likely increase across the board in the future, and important skills that will be required include creativity, social intelligence, and entrepreneurial thinking (see, e.g., Rinne and Zimmermann, 2016). The education system, and more specifically the vocational education and training system, therefore needs to be adapted accordingly to find effective ways to provide workers with the required skills and qualifications.

In this context, Germany's dual apprenticeship system, which combines vocational schooling and structured learning on-the-job (Eichhorst, 2015), may actually serve as a role model – at least with respect to two important aspects that it involves. The first important aspect is its strong demand orientation. It guarantees that graduates' skills are tailored to the demands of the labor market, and it avoids obtaining useless qualifications. The second important aspect are some universal skills that are (implicitly) promoted, including fundamental problem solving competencies, a high identification with the employer, a specific working spirit and work ethic, and a general openness for new challenges.

In addition, the need for hybrid and interdisciplinary vocational training models will very likely increase significantly in the future – also in response to the rising complexity of the world of work (BMWi, 2017). This will require, among other things, revised and new curricula that span multiple disciplines and that are more strongly oriented towards real working processes. Hence, stronger cooperation and closer links between educational institutions, training providers, and firms are needed, too. The good news is that digitalization also offers new possibilities in the area of vocational education and training. These vast opportunities should be adequately used, which requires to adequately prepare students, but importantly also teaching professionals to effectively and efficiently use instruments such as e-learning or blended learning approaches.[4]

[4] See, e.g., Tyilo (2017) for a review of e-learning in higher education, and O'Byrne and Pytash (2015) for details on blended learning (or hybrid learning).

Educational challenges, however, are not only related to the critical period of labor market entry at the beginning of the employment career. Similar challenges also arise in earlier and later stages of a person's life. For example, it is often argued that IT skills such as programming should already be promoted in schools as they are an important cultural skill for the 21st century (see, e.g., BMWi, 2017). Again, such an approach also requires extra efforts in teacher training, which should at least include some basic IT knowledge. Finally, there will also be an increased need for lifelong learning, which must be appropriately met because the demand for advanced and further training for all groups of employees at all qualification levels will increase dramatically across the board. Further and continuing education has to become the norm rather than the exception to prepare workers for continuous changes. This requires on the one hand also (financial) incentives for workers and firms – especially as far as general skills are concerned, where public investments may even be tax financed (Weber, 2017). On the other hand it requires support, guidance and monitoring to effectively steer workers' and firms' efforts.

4. A New Perspective on Workers, Firms, and the Welfare State

New business models of the platform economy may also require a new institutional perspective on workers, firms, and the welfare state. Challenges with respect to workers concern, for example, the areas of social security and income declaration of platform workers. Another important issue (with many implications, among others in the area of taxation) is finding an appropriate approach for the profit allocation of online or virtual companies.

The platform economy involves a transfer of risk to individual workers. As online firms and virtual companies usually do not consider themselves as employers, but only as platforms, networks, marketplaces or intermediaries, their workers are formally self-employed, with all the associated risks like accidents or sickness, and costs such as for pensions, unemployment or long-term care (Eichhorst et al., 2017). New challenges for social policy arise from this transfer of risks.

However, it should also be noted that the platform economy has only just begun to unfold its potential. Current empirical evidence indicates that its actual importance is still small. For instance, even in the United States, which

plays a leading role in this context, the proportion of the employed persons who offer their services through online platforms is estimated at only 0.5% in 2015 (Katz and Krueger, 2016). At the same time, available data suggest that in most cases these are secondary jobs, and that income from these jobs usually supplements other types of household income. Hence, online platform work can still be viewed as being predominantly a source of additional earnings (on top of offline activities).

But the growth potential of the platform economy is undoubtedly immense. It has the potential to develop very dynamically and expand to cover a wide range of services. The task of social policy is therefore to engage early enough with its associated challenges, armed in particular with a framework creating a level playing field between different types of suppliers. A first approach is to trace the conventional distinction between dependent employment and self-employment. Borders between these forms of employment become increasingly blurry, implying that traditional classifications and schemes are no longer applicable. Hence, the introduction of a third category of workers, next to self-employed and dependent employees, is heavily debated, for example, in the form of "dependent contractors" or "independent workers" (see, e.g., Aloisi, 2016; Maselli, 2016). Also in the United States, the introduction of a new category of "independent worker" is discussed – specifically to harmonize the social security system with the requirements of the platform economy and to bring it into the digital world of work (Harris and Krueger, 2015).[5] A slightly different proposal is to include platform workers in the scope of the general rules applicable to self-employment. For example, Goudin (2016) views this option as preferable to other options.

A second approach would extend employment-related social security also to employment forms that are currently not included, especially also to self-employment, both in case of online and offline freelancing, and both for main and secondary activities. This applies in particular to social insurance for old age and disability, but also for unemployment (Eichhorst et al., 2017).

[5] Austria introduced the construct of a "free service contract" already some time ago. This form of employment supplements traditional service contracts, as it is based on hourly-wage payroll accounting and also includes full social security contributions. However, specific difficulties arise with privileges and benefits that are per definition linked to working time or hourly wages (such as overtime rules and minimum wage provisions).

For example, in Germany only certain groups of "employee-like" self-employed individuals are currently required to pay into the statutory pension insurance scheme (e.g., teachers, nurses). Other groups have access to different or occupation-specific models (e.g., artists and journalists, doctors, architects, lawyers). A major advantage of a more universal social security insurance system lies in the fact that the problem of identifying the currently important distinctions between different employment forms, and even occupations, will be substantially mitigated.

Against this background, it seems plausible to bring self-employed workers of all types into the social security system rather than providing them with a rather generous "opt-out" clause. For example, it may be reasonable to require all self-employed workers to pay at least a minimum amount of contributions into the statutory system. Of course, this would require the self-employed to take taxes and contributions into account when setting their prices. The contributions of the self-employed workers themselves could also be supplemented by compulsory contributions from the customers or the intermediaries and platforms, which are the equivalent to an employer in the platform economy. These could be paid directly or could be claimed by the self-employed person when invoicing for their services. The German model of social security for artists (*"Künstlersozialkasse"*) is an existing example in which the liability for one part of the contributions is with the users. In addition, a certain percentage of tax financing could be considered – which would, of course, also be generated from tax revenue of platform-based entrepreneurial activities.

Another more general challenge, which absolutely requires stronger international cooperation and coordination, is to implement tax liability in the virtual and global platform economy. Also tax rules have to adapt to a changing business environment in the digital economy. In particular two concepts are hardly applicable for virtual and global firms with intangible assets (Becker and Englisch, 2017a). The first concept is the so-called permanent establishment. Here, it appears necessary to find a practicable way to also include virtual establishments. The second one is the so-called arm's length principle for transfer prices. As platform firms or digital companies often create their own markets, it is indeed very hard – if not impossible – to find an appropriate comparison to value their goods, services and intangible

assets such as very unique patents. While in this context the introduction of a destination based cash flow tax is proposed in the United States (Becker and Englisch, 2017b), the introduction of an equalization tax is discussed in the European Union (BMF, 2017).

In any case, one issue appears to be key in the ongoing debates about social security, taxes, and the welfare state. It is precisely the question if and how virtual value creation can still be located in the real world. Current social security and tax concepts rely on the physical presence of workers and firms in a precisely defined location. When value-added chains become more and more complex and diffuse, and the role of firms as employers increasingly blurry, it could be reasonable to consider the perspective of consumers in this context. It will continue to be the case that they can rather precisely located in the real world (at least from today's perspective), and therefore shifting the perspective towards consumers in the areas of social security and taxation could mitigate at least some of the "digital challenges". Consumers may serve as the much needed anchor point and channel through which (employers') social security obligations and taxes can still be determined and collected also the digital economy, for example, via consumption taxes – if intelligent ways can be found to shift their incidence not also from firms to consumers, which also depends on both the demand elasticity and supply elasticity.

5. Conclusions

Digitalization has indeed the potential to fundamentally change the functioning of our economies, labor markets and welfare states as we currently know them. However, the full dimension of the digital transformation is only now emerging, and scenarios of massive upheaval and disruptions are not (yet) matched with the evidence at hand. Nevertheless, from a policy perspective this situation of a gradual transformation offers a window of opportunity to redesign established institutional solutions, in particular regarding skill formation, social protection and taxation.

There are two main risks or challenges involved: The first is to avoid, or at least limit, a further divide and polarization on the labor market due changing labor demand. Skill upgrading for the labor force, not only in the initial general and vocational education, but also over the entire employment career, will be crucial to safeguard employability for a broad segment of the

population in the future. The second issue that needs to be addressed is to make social insurance more inclusive and sustainable in a situation where we can expect to see more self-employed or freelance activities and a more global, highly mobile and fluid way of working, delivering and using services. This raises fundamental issues regarding the funding of social policies, but also public service provision more generally. In this respect, finding innovative ways to establish feasible solutions on how to tax internationally mobile market actors – platforms, firms or workers – is on the agenda.

Policy solutions in these two fields are necessary, and they should be designed and implemented while the window of opportunity is still open. Otherwise we might run the risk of major economic and societal distortions.

References

Aloisi, Antonio (2016). Commoditized workers: Case study research on labor law issues arising from a set of "on-demand/gig economy" platforms. Comparative Labor Law&Policy Journal 37(3), 653–690.

Autor, David, and Anna Salomons (2017). Does Productivity Growth Threaten Employment? Paper prepared for the ECB Forum on Central Banking, June 2017. https://www.ecbforum.eu/uploads/originals/2017/speakers/papers/D_Autor_A_Salomons_Does_productivity_growth_threaten_employment_Final_Draft_20170619.pdf.

Becker, Johannes, and Joachim Englisch (2017a). Ausgleichsteuer: Wie die EU-Finanzminister einen Pflock ins Neuland rammen wollen. Makronom. https://makronom.de/google-tax-ausgleichsteuer-wie-die-eu-finanzminister-einen-pflock-ins-neuland-rammen-wollen-23141.

Becker, Johannes, and Joachim Englisch (2017b). A European Perspective on the US Plans for a Destination Based Cash Flow Tax. WP 17/03, Oxford University Centre for Business Taxation.

Berg, Janine (2016). Income security in the on-demand economy: Findings and policy lessons from a survey of crowdworkers. Conditions of Work and Employment Series No. 74, Geneva: International Labour Organization (ILO).

BMAS (2017). Weißbuch Arbeiten 4.0. Berlin: Bundesministerium für Arbeit und Soziales (BMAS).

BMF (2017). Joint initiative on the taxation of companies operating in the digital economy. http://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Europa/ECOFIN_und_Eurogruppe/2017-09-18-eurogruppe-informeller-ecofin-nachbericht-september-anl3.html.

BMWi (2017). Shaping the Digital Transformation Within Companies – Examples and Recommendations for Action Regarding Basic and Further Training. Berlin: Federal Ministry for Economic Affairs and Energy (BMWi).

Buhr, Daniel, Claudia Christ, Rolf Frankenberger, Marie-Christine Fregin, Josef Schmid, and Markus Trämer (2016). On the Way to Welfare 4.0? Digitalisation of the Welfare State in Labour Market, Health Care and Innovation Policy: A European Comparison. Berlin: Friedrich-Ebert-Stiftung.

Degryse, Christophe (2017). Shaping the world of work in the digital economy. ETUI Foresight Brief #01, January 2017.

Eichhorst, Werner (2015). Does vocational training help young people find a (good) job? IZA World of Labor 2015: 112.

Eichhorst, Werner, and Ulf Rinne (2017): Der digitale Gestaltungsauftrag. ifo Schnelldienst 70(7), 16–18.

Eichhorst, Werner, Holger Hinte, Ulf Rinne, and Verena Tobsch (2017). How Big is the Gig? Assessing the Preliminary Evidence on the Effects of Digitalization on the Labor Market. Management Revue 28(3), 298–318.

Eurofound (2015). Upgrading or polarisation? Long-term and global shifts in the employment structure: European Jobs Monitor 2015. Luxembourg: Publications Office of the European Union.

European Commission (2016). Upskilling European industry: New operational tools wanted. Brussels: Recommendations of the Strategic Policy Forum on Digital Entrepreneurship.

Goos, Maarten, Alan Manning, and Anna Salomons (2014). Explaining Job Polarization: Routine-Biased Technological Change and Offshoring. American Economic Review 104(8), 2509–2526.

Goudin, Pierre (2016). The Cost of Non-Europe in the Sharing Economy: Economic, Social and Legal Challenges and Opportunities. Brussels: European Parliament, PE 558.777.

Harris, Seth, and Alan B. Krueger (2015). A Proposal for Modernizing Labor Laws for Twenty-First-Century Work: The "Independent Worker". The Hamilton Project, Discussion Paper 2015-10.

Hirsch-Kreinsen, Hartmut (2016). Digitalisation and Low-Skilled Work. WISO Diskurs 19/2016. Bonn: Friedrich-Ebert-Stiftung.

Katz, Lawrence F., and Alan B. Krueger (2016). The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015. NBER Working Paper No. 22667.

Leimeister, Jan M., David Durward, and Shkodran Zogaj (2016). Crowd Work in Deutschland – Eine empirische Studie zum Arbeitsumfeld auf Crowdsourcing-Plattformen. Düsseldorf: Hans Böckler Stiftung.

Maselli, Ilaria, Karolien Lenaerts, and Miroslav Beblavý (2016). Five things we need to know about the on-demand economy. CEPS Essay No. 21. Brussels: Centre for European Policy Studies (CEPS).

O'Byrne, W. Ian, and Kristine E. Pytash (2015). Hybrid and Blended Learning. Journal of Adolescent & Adult Literacy 59(2), 137–140.

Rendall, Michelle, and Franziska J. Weiss (2016). Employment polarization and the role of the apprenticeship system. European Economic Review 82, 166–186.

Rinne, Ulf, and Klaus F. Zimmermann (2016): Die digitale Arbeitswelt von heute und morgen. Aus Politik und Zeitgeschichte (APuZ) 66(18-19), 3–9.

Robertshaw, Steve, Nick Achilleopoulos, Johan E. Bengtsson, Patrick Crehan, Angele Giuliano, and John Soldatos (2015). The Collaborative Economy – Impact and Potential of Collaborative Internet and Additive Manufacturing. Brussels: EPRS European Parliamentary Research Service, Scientific Foresight Unit (STOA).

Schmidt-Drüner, Marion (2016). The Situation of Workers in the Collaborative Economy. Directorate General for Internal Policies, Policy Department A: Economic and Scientific Policy. Brussels: European Parliament, PE 587.316.

Tyilo, Nonzukiso (2017). E-Learning as Instructional Innovation in Higher Education Institutions (HEI's): Lessons Learnt from the Literature. Journal of Communication 8(1), 87–93.

Weber, Enzo (2017). Digitalisierung als Herausforderung für eine Weiterbildungspolitik. Wirtschaftsdienst 97(5), 372–374.