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The impact of digitalization on employment-productivity and the role of Social Protection: Socio-economic costs andlegal options*

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Ο αντίκτυπος της ψηφιοποίησης στην απασχόληση-παραγωγικότητα και ο ρόλος της κοινωνικής προστασίας: Κοινωνικο-οικονομικά κόστη και νομικές επιλογές

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ABSTRACT

The paper begins with a description of digitalization of work. The negative effects are the first to be examined and subsequently the positive effects are presented. Five outcomes with double effects (a negative and a positive one) arise from the analysis of digitalization on employment and productivity. Further, the implications of digital work on social security are illustrated, as well as the legal lacunae at a national, European and international level. Lastly, we conclude to suggestions which could counterbalance the negative effects and enhance the positive ones utilizing techniques from the European legal order.

KEY WORDS: Digitalization, employment, productivity, social security, social protection, costs, legal options

ΠΕΡΙΛΗΨΗ

Το άρθρο εκκινά αποτυπώνοντας την ψηφιοποίηση της εργασίας. Τα αρνητικά αποτελέσματα είναι τα πρώτα που εξετάζονται και στη συνέχεια παρουσιάζονται τα θετικά αποτελέσματα. Πέντε άξονες με αμφίπλευρες συνέπειες (αρνητικές και θετικές) προκύπτουν από την ανάλυση της ψηφιοποίησης στην απασχόληση και την παραγωγικότητα. Επιπλέον, απεικονίζονται οι επιπτώσεις της ψηφιακής εργασίας στην κοινωνική ασφάλιση, καθώς και τα νομικά κενά σε εθνικό, ευρωπαϊκό και διεθνές επίπεδο. Τέλος, καταλήγουμε σε προτάσεις που θα μπορούσαν να αντισταθμίσουν τις αρνητικές επιπτώσεις και να ενισχύσουν τις θετικές με τη χρήση τεχνικών από την ευρωπαϊκή έννομη τάξη.

ΛΕΞΕΙΣ-ΚΛΕΙΔΙΑ: Ψηφιοποίηση, απασχόληση, παραγωγικότητα, κοινωνική ασφάλιση, κοινωνική προστασία, κόστη, νομικές επιλογές

1. Introduction

Social protection systems around the world alongside with the labour markets face challenges due to the insertion of technology in the working lives to an unprecedented extent. Digitalization is perceived to consist of automation and platform economy (Eichhorst and Rinne, 2017: 1). In the world of work, we see an increasing number of self-organized production systems,

"crowdwork", that operate independently with people working from home or from the other side of the globe, delivering in real time (ISSA, 2016: 29). In other words, forms of work in the "gig-economy" include "crowdwork", and "work-on-demand via apps", under which the demand and supply of working activities is matched online or via mobile apps (De Stefano, 2016: 1). Social security and occupational safety and health (OSH) systems developed in response to the risks associated with the societal structures, labour markets, labour relations and production technologies of the "industrial" mid twentieth century (ISSA: 2016, 29). Despite the transformation of socio-economic environment in light of an unprecedented digitalization, social security is expected to (continue to) cover the social risks a human being may face during his/her life. Besides, in a broader sense, social protection promotes fairness, social conscience/responsibility and social justice (Tsetoura: 2015). Social policies based on investments in human and social capital are conducive to higher economic efficiency for they improve productivity and the quality of the labour force (Fouarge: 2003: 37-38). While some emerging work and employment arrangements may provide greater flexibility for workers and employers, they may lead to significant gaps in social protection coverage, at a time when demands on social protection systems are increasing (ISSA: 2016: 29). In any case, the technology's insertion in the working lives and its strong correlation with the new digital economy has both advantages and disadvantages. The recent pandemic highlights the abovementioned more than ever.

2. Methodology

This is a descriptive qualitative analysis based on data from international literature. The employment is approached in-hand with productivity. The latter is a necessary prerequisite of growth. To this end, social protection is essential as well. As we can observe, there are certain negative and positive effects which are not found in literature to be correlated with digitalization of work. Presenting the different kinds of the digitalization's influence, we aim at pointing out the need for the adaptation of the legal framework concluding to certain legal options. The main research question is: which is the impact of digitalization on employment and productivity of the working persons?

The research sub-questions are: which is the role of social protection and which could be the possible legal measures in order to counterbalance the negative effects and to enhance the positive effects?

3. The Impact of Digitalization on employment and productivity

As ISSA notes, the economic and employment outlook based on the likely impacts of digitalization is mixed: Though there may be opportunities for stronger economic growth and improved social wellbeing, other outcomes may be job losses, increasingly fragmented labour markets, the need to adapt labour codes to new forms of work, the further feminization of some economic sectors, and the normalization of "atypical" employment (ISSA: 2016: 30). As presented below, there is situated an interrelationship between certain negative effects, as well as between certain positive effects.

3.1. The negative effects

A. De-standard work/flexibility as insecurity

Many of the new forms of employment are found in non-standard employment (NSE), which describe a range of contractual arrangements that deviate from a standard open-ended, full time, dependent employment relationship, which constitutes the key reference point for most labour and social security legal and policy frameworks (Behrendt and Nguyen/ILO, 2018a: 24). The 'agility' of digitalization relates to workplace, to working hours, and also to the relationship of subordination between employer and employee having an impact on management, as well as on the new forms of non-salaried work, i.e. the self-employed and freelance workers whose numbers are steadily increasing in the United States, the Netherlands, Germany, France, and elsewhere (Degryse, 2016: 17). Working conditions are evolving in many sectors; in some there is already more flexibility in working hours and if imposed, this may be viewed by workers as a source of insecurity (ISSA, 2016: 30). In many cases, non-standard forms of employment can result in precarious or insecure work especially for those in new forms of employment, such as workers on digital platforms (Behrendt and Nguyen/ILO, 2018a: 1). Another potential risk may be how to ensure compliance with OSH standards amongst the increasing number of people working in the digital economy under non-traditional, individualized conditions, as well as new forms of psychosocial pressure and workplace stress; these kinds of stress already contribute to around half of all lost working days in Europe (ISSA, 2016: 30).

B. Automation

Automation comprises the increasing use of robots, machines and algorithms in value chains, which is moreover no longer restricted to simple routine tasks (Eichhorst and Rinne, 2017: 1). The question for labour markets and social security systems is what might be possible if many forms of work have been replaced by automated processes and new technological solutions (ISSA, 2016: 31). The OECD estimates that 14% of jobs are at high risk of automation (OECD, 2019: 13). Frey and Osborne (2013) examined expected impacts of future computerisation on US labour market outcomes, with the primary objective of analysing the number of jobs at risk and the relationship between an occupation's probability of computerisation, wages and educational attainment. According to their estimates, about 47 percent of total US employment is at risk, while they further provide evidence that wages and educational attainment exhibit a strong negative relationship with an occupation's probability of computerisation. Other studies suggest that neither technological progress in general nor digitalization in particular will broadly replace human labor (Eichhorst et al, 2016: 2). In any case, while the future may be uncertain, automation may not always be cost-effective or desirable, it may raise legal and ethical concerns, and it will be affected by people's preferences and policy decisions (OECD, 2019: 13).

C. Inequality

Platform economy 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: 1). Serious concerns remain with regard to the workers' unclear legal status, lack of social protection coverage and lack of voice and representation, while the increasing prevalence

of work mediated by digital platforms has also brought about challenges in the attainment of decent work, similar to those attached to casual work (Behrendt and Nguyen/ILO, 2018a: 24). The structure of the market of digital platforms has potentially very important implications for pay and working conditions; monopsony[1] in the labour market will tend to lead to relatively lower wages and employ fewer people than in a more competitive labour market (Eurofound, 2017: 21). Despite performing valuable work for many highly successful companies, compensation from crowdwork is often lower than minimum wages, workers must manage unpredictable income streams, and they work without the standard labour protections of an employment relationship (Berg et al/ILO, 2018: 18). Moreover, as far as social security coverage for workers engaged in digital work is financed through their coverage through their main job in the "traditional" economy, this raises concerns about fair competition and equity regarding the financing of social protection systems (Behrendt and Nguyen/ILO, 2018a: 24). Further, there is also the category of bloggers meaning those who earn income from the advertisements of products/services on their sites from the respective companies (and not those having a site as a personal diary). Yet, these persons may not be considered as working, neither as self-employed, neither as having an e-shop, despite the fact that blogging may be their main/only source of income. The number of bloggers worldwide is increasing, but there is not any extensive study dealing with this new form of employment.

D. Work-personal life imbalance

The global outsourcing of work through platforms has led to the development of a 24-hour economy; this process has stretched the number of consecutive hours of work both paid and unpaid – often eroding the fixed boundaries between home and work (Berg et al/ILO, 2018: 70). As the findings of the relevant survey indicate, due to low pay and lack of social protection, workers had to constantly look for work, and adapt to the temporal distribution of jobs depending upon their location (Rani and Furrer, 2019). This often meant a high intensity of work, as they worked long hours, especially during evenings and nights, making flexibility and work life balance quite illusory (Behrendt et al/ISSA, 2019). According to the ILO survey (Berg et al, 2018), on average, in a typical week workers spent 24.5 hours doing crowdwork, of which 18.6 hours were paid work and 6.2 hours unpaid (e.g. looking for tasks, completing qualification tests): as a result, for every hour spent on paid work, roughly one-third (20 minutes) of additional time is spent on searching for tasks. The need to constantly look for work, the idiosyncrasies of task posting, and differences in time zones meant that many workers worked long hours and atypical hours, while a large proportion of workers worked during the night (10 p.m. to 5 a.m.; 43 per cent) and during the evening (6 p.m. to 10 p.m.; 68 per cent), either in response to task availability or because of other commitments (Berg et al/ILO, 2018: 67). Furthermore, another parameter should be also taken into account, that is, the non recognition of their work within their environment. Hence, their digital work is "invisible" and at the same time it might get difficult to fulfill their tasks if they are not treated as working just because they are at their home.

E. Cost – inefficiency: Gaps of social protection and "digital syndromes"

Firstly, the cost becoming obvious already is that caused by the "free riding" digital economy. Greater job and income insecurity and low pay increase the demand for social protection and put stronger pressures on both social insurance and social assistance schemes (Behrendt and Nguyen/ILO, 2018a: 2). In some cases, workers combine platform work with salaried employ-

ment, which means that they may enjoy some social security coverage, albeit often incomplete (Behrendt and Nguyen/ILO, 2018a: 25). This also raises concerns about the "new" economy free riding with regard to the financing of social security at the expense of the "traditional" economy, as well as the equitable and sustainable financing of social protection systems (Behrendt et al/ISSA, 2019). However, the long-term cost should be also taken into account both in social and economic terms.

The cost at issue has to do with the extensive use of the screens for the purposes of work. According to the International Classification of Diseases (ICD-10) of the World Health Organization (WHO), visual fatigue - also called visual strain - is classified as a subjective visual disturbance (H53.1), manifested by a degree of visual discomfort typically occurring after some kind of prolonged visual activity, and characterized by fatigue, pain around the eyes, blurred vision or headache (Benedetto et al, 2013: 2). In this framework, the need to empirically evaluate visual fatigue on e-readers and paper is getting more and more important. However, only few studies have focused on visual fatigue (Benedetto et al, 2013: 2). Computer vision syndrome, also known as digital eye strain, is the combination of eye and vision problems associated with the use of computers (including desktop, laptop and tablets) and other electronic displays (eg smartphones and electronic reading devices) (Rosenfield, 2016: 1). In fact, there continues to be growing evidence in the literature that dry eye disease negatively impacts quality of life and visual function across more domains than healthcare providers may realize (physical health, psychological well-being, level of independence, environmental impact) (Guo and Akpek, 2020). In today's world, the viewing of digital screens for both vocational and avocational activities is virtually universal (Rosenfield, 2016: 1).

Digital eye strain has been shown to have a significant impact on both visual comfort and occupational productivity, since around 40% of adults and up to 80% of teenagers may experience significant visual symptoms (principally eye strain, tired and dry eyes), both during and immediately after viewing electronic displays (Rosenfield, 2016: 1). Recent published works support dry eye disease to decrease productivity (Yamada et al., 2012, Nichols et al., 2016, Craig et al., 2017, Guo and Akpek, 2020). More specifically, recent studies found dry eye to reduce workplace and nonjob related performances and create substantial loss to work industry (Yamada et al., 2012, Nichols et al., 2016, Craig et al., 2017, Guo and Akpek, 2020). The cost that the social protection systems and health care will have to bear has been neglected, as well as how the massive labour force exhaustion due to their exposure to the screens will affect productivity and growth overall. Nowadays, this is more relevant than ever because of the corona pandemic and the massive use of screens in order to avoid physical presence and meetings.

3.2. The positive effects

A. De-standard work/flexibility as freedom

One of the positive benefits of crowdwork, noted by many of the ILO survey respondents, is the ability to set one's schedule, as well as work from home or from another location of the worker's choice (Berg et al./ILO, 2018: 67). Crowdwork can provide a high level of flexibility for workers in terms of the selection of tasks, how much one works, the place of work and the organization of one's work and allows those who prefer to work from home the ability to do so, whether for health reasons, domestic responsibilities or simply a preference to be in one's own home (Berg et al./ILO, 2018: 67). The latter may refer to stay-at-home women for the purposes of taking

care of children or elderly relatives and is also related to equality issues presented below. The flexibility element of remote work is already utilized by large companies giving the choice to their employees to work from home (known as home office). Hence, there is a combination of traditional workplace with the digital opportunities such as working from home. The ability of hiring skilled staff from all over the world could also benefit companies opting for the remote work. According to FlexJobs' (2017) sixth annual survey of more than 5,500 respondents, 66% of professionals think they would be more productive working remotely than in a traditional office (Reynolds, 2017).

However, in our opinion, the most important reason why the flexibility that the digital work provides has a positive effect is the possibility of work for certain categories beginning with the disabled persons. As a matter of fact, there are not surveys examining the impact of digitalization of work with regard to persons with disabilities and their inclusion in labor market or to which extent the digital work promotes their productivity. There are significant numbers of adults with physical and mental disabilities who have a shortage of opportunities for economic participation. Within the context of the ILO synthesis of national dialogues, some countries, such as Austria, Australia and Germany, expressed the view that technological innovations will play a substantive role in facilitating the inclusion of workers with disabilities at work (ILO, 2017b: 30). Last but not least, in times of a pandemic such as COVID-19, the continuation of work would be impossible without the digital means. On the contrary, a global financial/social breakdown would be the case without digitalized work. Namely, the productivity has been kept on a sufficient level due to digitalization and its extensive use in the various countries around the world not only during the lockdown but also afterwards.

B. Automation

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 (Eichhorst and Rinne, 2017). Moreover, there is an expected reduction in work-related accidents and diseases, as it may become more possible for dangerous work tasks to be automated, however, greater reliance on robotics can only remain positive if this continues to be underpinned by strong regulations to protect workers and prevent workplace accidents and injuries (ISSA, 2016: 30). This is also the case about algorithms on the basis of which many digital tasks are fulfilled.

C. Equality

One of the benefits of crowdwork is that it allows workers to work from home and thus provides opportunities to workers who would otherwise not have access to paid work; this is particularly true of women, who, throughout the world, overwhelmingly shoulder the burden of care responsibilities (Berg et al./ILO, 2018: 69). According to the recent study of ILO (Berg et al. 2018), women with small children noted in the qualitative responses as well as in follow-up interviews that they preferred crowdwork as it allowed them to engage in some form of work and earn some income and at the same time take care of children or elderly relatives and perform housework. In addition, in countries where family policies are almost absent (the US) or where the provision of public childcare services is limited (Italy and the US), a large share of women still withdraw from the labor market taking into account the high cost of child care (Anxo et al., 2011: 90).

For women workers, working from home not only reinforces gender roles, alienating them from social relations, but it can also exacerbate their income insecurity as they lack social protection coverage and earn low incomes (Behrendt et al/ISSA, 2019). Moreover, emphasis should be also given on the fact that everyone has equal access to jobs due to digitalization. Besides the women with care responsibilities, the disabled persons can possibly work like everyone else, while otherwise they could not have access to any work at all. There should be noted that digital work offers opportunities of labour and social/economic participation not only to persons with restricted mobility but also to deaf or blind persons (e.g. google voice).

D. Work- personal life balance

This effect is associated with the abovementioned. As already pointed out, digital platforms have the potential to provide employment and income generation opportunities with a high degree of flexibility, for instance for persons with limited mobility or care responsibilities (Behrendt et al/ ISSA, 2019). But this is not only the case. The recent ILO/Gallup survey (2017) found that balancing work and family is the biggest challenge for women in developed and emerging countries, and ranked as the second biggest challenge in developing countries. According to surveys of FlexJobs, since 2013, work-life balance (78%), family (49%), time savings (46%), and commute stress (45%) have been the top four reported reasons people seek flexible work (Reynolds, 2017). Despite much progress in reducing working hours in the past century, working time remains a major challenge for workers in maintaining a healthy and balanced family life, especially in developing countries where working hours continue to be typically very long, often exceeding the weekly threshold of 48 hours specified in the ILO Hours of Work (Industry) Convention, 1919 (No. 1) and this is why in developed countries, recent years have seen significant slowdowns in working-hour reduction (ILO, 2017c: 20).

E. Cost-efficiency: Preventing anti-social behavior - future costs

This effect is particularly correlated with the possibility of parents to stay at home to raise their children and especially mothers while working digitally. As already mentioned above, according to the relevant ILO survey many mothers preferred crowdwork so as to be engaged to some form of work and at the same time to take care of their families. Noteworthy, caring directly for family members and others, as well as other activities associated with home-based work ensure the maintenance and reproduction of people and societies (ILO, 2017c: 18). This seems to be extremely important for the "adult-to-be" children. Attachment insecurity is a significant predictor of public cost in at-risk youth, even after accounting for covariates (Bachmann et al., 2019: 1). Since adolescent attachment security is influenced by caregiving quality earlier in childhood, the findings of Bachmann et al. (2019) add support to the public health case for early parenting interventions to improve child outcomes and reduce their cost on society. The study of Bachmann et al. (2019) is the first study to investigate the financial costs associated with attachment security, a key marker of caregiving quality associated with a wide range of social, emotional and behavioural outcomes in children and adolescents. The results showed that in a key group of young people, those at risk of poor outcomes due to moderate or severe early-onset antisocial behaviour, insecure attachment was associated with significantly greater cost, both overall and across individual domains such as education, social care and health (Bachmann et al., 2019: 5). Importantly, costs were greater even after controlling for multiple other risk factors known

to be associated with increased health costs and service utilisation, including socioeconomic background, child age, gender and IQ, and severity of antisocial behaviour -most of which were independently associated with increased economic burden (Bachmann et al., 2019: 6).

4. Critical comments

Taking into account the abovementioned, we conclude that either we are discussing about the negative effects or the positive effects the variables are the same. Hence, these five outcomes are those arising from the analysis of digitalization on employment and productivity: a) the de-standardization/flexibility of work, b) the automation c) the work-personal life balance d) the equality and e) cost-efficiency. The latter can become obvious in our table below. After clarifying the effects of digitalization, we focus on how the negative effects will be counterbalanced and the positive effects will be promoted in the means of law by examining the legal challenges and presenting the legal options.

EFFECTS OF DIGITALIZATION	(-)	(+)
De-standard work/flexibility	Insecurity Informality	Freedom Remote workers by choice or necessity - The pandemic factor
Automation	Job loss	Protection from professional diseases/accidents
Work- personal life balance	High intensity of work Inability to plan the tasks	Ability to work and offer to family at the same time
Equality	Unclear legal status Lack of representation	Equal access for all
Cost-efficiency	Free-riding economy Digital exhaustion	Preventing anti-social behavior of "adults-to-be"

5. Legal implications and lacunae

Technological change and digitalization are creating new forms of invisible work, in the sense that the virtual/digital workers have no dedicated location and their employment relationship is often not recognized (ILO, 2017c: 18). The extent to which virtual labour will come to represent a significant portion of the global labour force remains unclear; whether these forms of work will ultimately fall within the ambit of the employment relationship, become new types of informality or fail to fall within existing regulatory frameworks also remains uncertain (ILO, 2017c: 18). Much of the work on digital platforms is part-time, temporary, often casual, and the boundaries between genuine self-employment and disguised employment relationships tend to be blurred (Behrendt and Nguyen/ILO, 2018a: 24).Workers in the gig economy are generally classified as independent contractors and, as such, they have no access to the vast bulk of employment protection (De Stefano/ILO, 2016: 8). Even if they were classified as employees, however, the intermittent nature of their activity could be an obstacle to accede to important employment

or social rights, such as maternity leave, paid holidays, full unemployment benefits, when these rights are dependent upon a minimum length of service: this risk they share with temporary and casual workers in several jurisdictions (De Stefano/ILO, 2016: 8).

Existing labour and social security laws are often not sufficiently specific with regard to the coverage of workers on digital platforms, and are often not adequately enforced to ensure compliance, especially on crowdwork platforms, where tasks are divided into micro-gigs and delegated to a large pool of virtual workers, workers tend to execute multiple jobs for multiple "employers" in a single day (Behrendt and Nguyen/ILO, 2018a: 24). Particularly problematic is that companies can 'hire' people from all countries - including developing and emerging countries - at the lowest wages, without carrying any social obligations and without any transaction costs (Chesalina, 2018: 17). From the point of view of social law, the central challenges of the platform economy are the lack of social security for digital workers as well as the fiscal sustainability of the social security systems (Chesalina, 2018: 18). Further, the latter has also to do with the question which country's legislation will be applicable when indifferent countries mediated through digital platforms. The International and European agreements should include provisions regarding the "virtual workers". The relevant EU legal instrument, the EU Regulation Coordination on Social Security Systems could serve as a solution in the area of Europe and maybe as an example worldwide as shown below. In this context, the discussion about residence criterion (lex loci domicilii) or the employment criterion (lex loci laboris) becomes also relevant (Tsetoura 2017).

6. Legal options

The impact of technology on the world of work will depend on how gains are distributed, given the widening income inequality among countries and regions, and whether the transition creates decent and quality work (ILO 2017c: 10). At an international level, Enzo (2018) suggests 'digital social security'. It would automatically pay a fixed percentage of the agreed salary into the personal DSS account of the platform worker (either on top of the agreed salary, or as a deduction, or as a mixture of both) and this simple pay-as-you-earn mechanism would be the only element to be included into the different platforms (Enzo/ILO, 2018: 3). The accrued amounts would be transferred once a month from the DSS accounts to the relevant national social security systems (according to the place of residence, or nationality, if desired) and there, all further steps could be handled within existing structures (Enzo/ILO, 2018: 3).

There are also suggestions of making entitlements portable in order to support mobility across jobs and forms of employment (OECD, 2018: 35) or the introduction of a third (intermeɲdiate) group between employees and independent contractors, which could help to find the right balance between universalism and selectivity and protect workers who share only some of the characteristics of employɲees by bringing them into the scope of some labour and employment laws (Davidov, 2017: 8). At the same time, the experience of some countries (e. g. Italy) shows that the introduction of an intermediary category will rather contribute to the circumvention of the existing 'employee' category and become an obstacle for (digital) workers to achieve appropriate labour and social law protection (Cherry and Aloisi, 2017: 675) than to tailor-made solutions and more precise regulations (Chesalina, 2018: 21). Also from the German perspective the inclusion of digital workers into social/penɲsion insurance risks a worsening of the situation of the self-employed digital workers with a low income if the contributions has to be paid out of these low incomes, while, on the other hand, their chances to receive a pension

above the social welfare level are low (Chesalina, 2018: 25). Notwithstanding the above, any national legal solution reaches its limits when platform operaȠtors or their clients are based abroad and this is why it would be desirable to create framework conditions for the payment of social contributions at least at the European level (Chesalina, 2018: 25).

The relevant EU legal instrument which could offer solutions is the EU Regulation Coordination on Social Security Systems. In fact, Coordination Regulation provides for the electronic exchange of social security information (EESSI). Is it possible for new "digital provisions" to be included? The existing provisions of Regulation 883/2004[2] could adapt in order to be extended to virtual workers. EU Coordination Regulation applies if there is a cross-border element between at least two member states. For digital workers there is not a movement/mobility geographically, but there is a "virtual mobility". For example, a person is resident of France and pursues an activity digitally for a company in Sweden. According to the present rules of Regulation 883/2004 (Article 11), this person is subject to the state of activity. Is the activity pursued on the state where the person lives or is it considered to be pursued on the state where the company is? Then the question goes to the consideration of this person working as an employed or self-employed. The changes in the provisions of the old Regulation 1408/71 being supported by the recent case-law focus more on the concept of the place of activity rather than its classification as employed or self-employed (Tsetoura, 2014). Apart from the traditional workplace, a place of activity should be considered the digital workplace. In the same example if the person pursues activities digitally for other companies as well, located in various member states, to which state's legislation will the person at issue be subject? Article 13 Reg. 883/2004 (pursuit of activities in two or more member states) could be helpful in this respect.

However, as long as the digital activity is not clarified in national laws as an activity of an employed or a self-employed so as to apply the existing rules of Reg. 883/04 on determination of applicable legislation, a different approach could be made. A clear-cut criterion to be used within but also outside the European legal order is the origin of the main source of income. Namely, if a person earns his/her income from the digital activity pursued for a company, the place of business of which is on the state A, the person at issue should be subject to the legislation of state A for the purposes of social security law. If a person pursues activity digitally for companies, the places of business of which are on various member states, the person should be subject to the legislation of the state where the company paying the person the largest amount of his/her income is located. In case the person has another source of income from an activity non digital, which is combined with a digital activity, there are many complications.

Yet, the criterion of the main source's income origin could be again applied in order to answer on the basis of which activity the person should be insured, the digital or the non digital. Between a digital activity and a non digital activity, to be an activity the predominant, the person should earn from the activity at issue more than 60% of his/her income. For example, if a person living in France and working there as a self-employed (non digital activity gaining 40% of the income) pursues digital activity for a company/client on Belgium (gaining 60% of the income), the applicable legislation will be the one of Belgium on the basis of the digital activity as the main source of income. It is interesting that the result would be the same if the digital activity was considered as an activity of an employed person according to Article 13, par. 3 Reg. 883/04. Article 1 (a) Reg. 883/04 provides: 'activity as an employed person' means any activity or equivalent situation treated as such for the purposes of the social security legislation of the Member State in which such activity or equivalent situation exists. If in the foregoing example the Belgian social law considered digital activity as an equivalent situation according to Article1 (a) Reg. 883/04.

Further, other suggestions of legal measures firstly at a national level could be the regulation of digital working time, the delimitation of the legal status of bloggers, the creation of a digital workers register, the granting of incentives to employers (tax exemptions) to hire and register special categories of working persons digitally (parents/mothers, disabled) and health protection from computer syndrome for those working either in the traditional workplace or in a digital platform exclusively, by granting extra vacation days for "eyes rest". The latter could also create jobs and maintain the productivity of the working persons. Lastly, a technique from Greece is referred as it could be used with regard to digital work i.e. the "ergosimo" (labour-ticket)[3].The labour ticket "ergosimo" is nominally transferred by the employer to the employees as payment for the remuneration of the work and then paid by the dispensers (banks and post offices) by payment of the corresponding amount after the relevant contributions have been withheld. Withholding insurance contributions and the net amount are written on the multipurpose check. From this multifaceted check one section is kept by the paying agent and the other section is guarded by the employer. At the end of each year, the social security institution sends an annual aggregated statement to the employer and the employee. The technique at issue was introduced in order to deal with undeclared work especially in the case of micro-tasks (Stergiou 2014: 454). In our case, an e-ergosimo could be provided.

7. Conclusion

Within this paper, we analyzed the double effects of digitalization on employment and productivity and the role of social protection. These effects are also important in view of the current times of corona. The recent pandemic brings into light the positive opportunities of digitalized work, but at the same time the negative effects coming alongside with the possibilities. This is why we think that the effective regulation of both the negative and positive outcomes plays a crucial role. We discussed how to counterbalance the negative effects and to enhance the positive ones, examining the legal challenges and presenting suggestions from literature. Then we particularly focused on the EU legal instrument on coordination of social security which can be adapted and offer solutions. Lastly, we presented certain legal measures placing a digitally purposeful regulatory framework. The regulation of the status of all the factors involved in the digital workplace is necessary at a national, European and international level.

Notes

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1. Monopsony is 'a situation in which the entire market demand for a product or service consists of only one buyer' (Collins Dictionary).
2. European Parliament and Council Regulation (EC) 883/2004 on coordination of social security systems, OJ L166/1.
3. "Ergosimo" was introduced regarding social security issues of home-based staff providing paid work or services, paid hourly or daily, at regular or non-regular intervals, either to one or more employers, for the same pay period covered by the IKA-ETAM insurance (Article 20 Law 3863/2010). Gradually it has been expanded to various categories of working persons (article 74 Law 4144/13).

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