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Artificial Intelligence and Labor Markets. A Critical Analysis of Solution Models from a Tax Law and Social Security Law Perspective

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Discussions on how to face problems regarding the changes within labor markets due to technology have so far been led by economists, who have mostly suggested a change within the social security system via the introduction of an unconditional basic income (UBI). Since Finland launched an experiment which examines the introduction of a UBI as a possible solution to these changes at the beginning of 2017, certain legal as well as socio-economic aspects will be pointed out that generally have to be considered by national governments when introducing a UBI. The second part of the essay focuses on possible different designs of the so-called "Robot-tax" which recently has been one of the central point of debate in relation to the overtaking of typically human jobs by AI and their impact on state finances. The two different scenarios, referred to A and B, represent the basis for a possibly necessary adaptation within social security law as well as the tax law sector. The main reason we chose to discuss the possible implementation of a UBI and of a "Robot-tax", instead of other possible measures, is that current discussions, especially within Europe, mainly focus on exactly these instruments.

Artificial intelligence – Automation – Job loss – Unconditional Basic Income – Robot tax

1. Introduction

The focus of this paper[1] is artificial intelligence (AI), which consists of intelligent computer programs that can perform tasks generally requiring human intelligence. Their main application can now be found in technologies whose applications characterize self-driving cars, drones, and virtual assistants, and goes from new types of "machine learning" to "intelligent" robots and computers that are capable of self-programming and of finding solutions from first principles[2]. In this paper we only consider AI which is not completely autonomous, that is to say, that it still requires human intervention.

The current prevailing estimation regarding the effects of AI on our labor markets predicts two potential outcomes: a lack of jobs and the resulting mass unemployment (referred to as *Scenario A*) or a complete change of required skills as a result of newly-created jobs (referred to as *Scenario B*). Even though

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one can argue that other scenarios might also be possible in future, we decided to focus on these two since they are the most frequently discussed these days.

According to a British study conducted by Frey and Osborne[3] 47% of jobs in the US are at risk because of automation, which is an indication that *Scenario A* might become reality within the next 10-20 years. Applying their data to Europe, about 53% of jobs might soon be subject to automation[4]. However, the results do not take into consideration that other jobs may arise from these developments, since only the probability of the computerization of current existing jobs was examined[5]. The reason this time shall be different to other industrial revolutions, as argued by Brynjolfsson and McAfee[6], is that, routine tasks are not the only ones at risk, so are non-routine cognitive tasks.

On the contrary, *Scenario B* refers to the fact that there has always been some kind of change in qualifications throughout history – one need only think of the Industrial Revolution – and thus this is just a new era, which requires adaptations in training and developments. Autor argues that «[j]ournalists and even expert commentators tend to overstate the extent of machine substitution for human labor and ignore the strong complementarities between automation and labor that increase productivity, raise earnings, and augment demand for labor.»[7]

As a result, it may be more beneficial to focus on how employees can adapt to the new skills which will be required for tomorrow's jobs. According to the Organization for Economic Co-operation and Development (OECD), such skills shall include Information & Communication Technology (ICT) skills as well as solid literacy, numeracy and problem-solving skills to use ICT effectively[8]. Additionally, one should not forget the changes to the labor market such as a shift to self-employment (e.g. from the rise of start-ups) or precarious work due to new types of work (e.g. crowdwork) that most probably will be inevitable.

Assuming *Scenario A* will be tomorrow's reality, countries will have to redefine current tax systems since there might be a huge loss in terms of revenue derived from wage-based taxes. For some States, this constitutes the main source of income (e.g. Austria). On the other hand, as a result of *Scenario B*, our current systems may also be affected by these changes and, therefore, our current social welfare systems as well as tax systems may have to be subject to reform. In order to contribute to these uncertainties, the goal of this paper is to analyze possible solutions from a tax law, as well as social security law, perspective.

The paper contains two main parts as well as an introduction and conclusion. Discussions on how to face problems regarding the changes within labor markets due to technology have so far been led by economists, who have mostly suggested a change within the social security system via the introduction of an unconditional basic income (UBI). Since Finland launched an experiment which examines the introduction of a UBI as a possible solution to these changes at the beginning of 2017, the first part of this paper analyses positive as well as negative aspects of the Finnish trial. Furthermore, certain legal aspects will be pointed out that generally have to be considered by national governments when introducing a UBI. The second part of the paper focuses on possible different designs of the so-called "Robot-tax" which recently has been one of the central point of debate in relation to the overtaking of typically human jobs by AI and their impact on state finances. The two different scenarios, as described above, represent the basis for a possibly necessary adaptation within social security law as well as the tax law sector. The main reason we chose to discuss the possible implementation of a UBI and of a "Robot-tax", instead of other possible measures, is that current discussions, especially within Europe, mainly focus on exactly these instruments. The conclusion will summarize the key aspects and findings resulting from either scenario.

2. First Part: UBI and the Finnish Experiment

A UBI is a sum of money to which every citizen is entitled. Since a basic income replaces all, or at least the majority of, social benefits the introduction of such a regime seeks to reform welfare systems that are currently based on insurance/assistance models and strictly linked to employment. Recipients do not have to meet any requirements (e.g. a means test, contribution periods), or fulfill certain tasks to "earn" their entitlement (e.g. demonstrating a willingness to re-integrate into the labor market). In fact, payments are completely unconditional[9].

Thus, the introduction of a UBI seems very tempting, especially if driven by the idea of inequality reduction[10]. At the same time, it will be very difficult to implement if one takes into consideration that the introduction of such an instrument shall replace current social welfare programs and therefore require restructuring of the allocation of public finances. Discussions regarding a UBI have already been held by famous politicians, philosophers and econo-

mists, from Erich Fromm to Martin Luther King Jr., and are therefore certainly not a new phenomenon. However, the idea seems to gain a new perspective through recent developments in the area of AI and resulting changes within labor markets, since employment for everybody cannot be guaranteed with certainty as discussed above. In both Finland and the Netherlands, a pilot project introducing a UBI was recently launched at the beginning of 2017. While UBI trials have been conducted around the world for several decades[11], the Finnish experiment has unique characteristics and therefore deserves to be observed and analyzed by lawyers, economists, politicians and other professionals around the world. While there has been an ongoing debate about both the advantages and disadvantages of such a regulation, this paper focuses on recent developments and, especially, legal aspects that have to be taken into consideration when analyzing a UBI.

2.1. Legal Prerequisites for the Introduction of a UBI

Assuming a political agreement regarding a basic income can be achieved, certain legal aspects still have to be considered to make an implementation legally viable. Therefore, concerns about whether a basic income scheme fits into the different national legal frameworks, are legitimate and need to be addressed. The biggest legal concern when talking about a UBI is whether it will be in accordance with our constitutional frameworks. Moreover, other legal aspects have to be dealt with during the framing as well as implementation process. The latter, of course, refers to issues that are limited in its time effects and that will not be a problem after some time.

2.1.1. Principle of Equality and European Social Rights

Pursuant to the established case law of the European Court of Justice (ECJ), the principle of equality is defined as "one of the fundamental principles of Community law. This principle requires that similar situations shall not be treated differently unless differentiation is objectively justified." Moreover, the ECJ ruled "that different situations must not be treated in the same way unless such treatment is objectively justified".

Furthermore, the principle of equality is also laid down in Article 20 of the Charter of Fundamental Rights (CFR)[12]. Current European social welfare systems are mainly based on reciprocity, solidarity and an individual's need proven through a means test. Due to the fact that a UBI aims to replace most social benefits, one can argue that such a scheme may infringe upon the principle of equality if it results in a complete reduction in benefits. However, since decisions regarding social security systems are made by Member States according to Article 153(4) of the Treaty on the Functioning of the European Union (TFEU)[13], within a Member State a UBI cannot be declared contrary to European Union (EU) legislation[14].

Therefore, a UBI has to be interpreted in light of the equality principle of each national constitution. Even though national interpretations of this principle might differ from country to country, in most European countries it is more or less defined as stated by the ECJ and thus there is a generally applicable definition within the EU. However, it is questionable whether a reform that promotes the introduction of a UBI scheme through a replacement of our current social welfare system may violate the principle of equality at the national level. Since certain national constitutions do not state that governments need to take positive action such as paying out additional benefits to equalize one's situation, such a scheme might still be in accordance with different national constitutions.

Others might argue that it is more than evident that the introduction of a UBI scheme which aims to replace all kind of benefits, in the worst case even medical care, is an obvious breach of the principle of equality since a healthy and sick person cannot be treated the same way because they do not have the same needs (both get € 1000, but one is in need of more in order to be able to pay his medical bills). The same applies to a situation in which a disabled person would require special treatment[15], or a situation in which an old person needed to stay in a retirement home, if we assume that in all these cases a UBI will not be sufficient to cover all needed expenses. Bob Hepple argued that even though some states do not entitle citizens to social rights in their national constitutions, not taking appropriate positive action can be seen as a violation of the principle of equality[16].

Even if a UBI scheme designed as described above is legally viable in light of the principle of equality, it is, in our point of view, questionable whether this is a step in the right direction towards an improvement of current social welfare systems. The basic intention of a UBI scheme might be good and respectful, but its effects devastating (see the examples above). This said, such a restrictive approach might be incompatible with Art. 34 CFR which states that

"[t]he Union recognises and respects the entitlement to social security benefits and social services providing protection in cases such as maternity, illness, industrial accidents, dependency or old age, and in the case of loss of employment [...]." or Art. 26 CFR according to which "The Union recognises and respects the right of persons with disabilities to benefit from measures designed to ensure their independence, social and occupational integration and participation in the life of the community." Furthermore, Art. 35 CFR states the following: "Everyone has the right of access to preventive health care and the right to benefit from medical treatment under the conditions established by national laws and practices. A high level of human health protection shall be ensured in the definition and implementation of all Union policies and activities."

Art. 2 of the Lisbon Treaty[17] also highlights the fact that solidarity as well as human dignity is one of the common values that should prevail in a society. Furthermore, the European Parliament "insists on the importance of preserving the values and principles underpinning all health care systems in the European Union, which comprise universal coverage, solidarity in financing, equity of access and the provision of high-quality health care"[18]. Moreover, "the guarantee of adequate social protection" is also mentioned in Art. 9 TFEU as well as in Art. 151 TFEU with respect to the European Social Charter (ESC)[19] which mainly focuses on social rights, and which entered into force in 1999 and has also been described as the "Social Constitution of Europe"[20]. Art. 13 ESC explicitly points out that a person in need without adequate resources should be granted social assistance and, if he gets sick, the care necessitated by his condition.

However, all these provisions are formulated as commitments and they act as an instrument of soft law. Despite the fact that these provisions are not legally enforceable, they can be seen as respected European values. Thus, it is very important that the concrete design of a UBI and its impacts on all other benefits are critically evaluated by national governments and politicians. Consequently, only the introduction of a UBI combined with certain means-tested benefits would not jeopardize current social security standards when taking into consideration European values.

2.1.2. Legal Issues Regarding the Implementation Process

Moreover, from a civil law perspective within continental Europe, the introduction of a UBI can only be undertaken on a legal basis since it gets funded through the financial budget of the government. Administrative actions may only be taken on the basis of a legal authorization (e.g. by an act, decree depending on national legal frameworks).

Consequently, a study has to be undertaken about which entity has the competence to implement a UBI. Depending on a country's structure (e.g. federal state, centralized state, etc.) powers and responsibilities might be allocated between different governmental bodies (such as a central government and regions/cantons or a federal state and regional states, as is the case in Austria and Germany). An examination of who the competent legislator is for the introduction of a UBI in Germany has already been carried out by a research group of the German Parliament and the results show a legal gap[21]. That is why, for the case of Germany, a new constitutional provision that empowers the legislator to implement such a social policy would be necessary. Since this would require regulation on the constitutional level, under German law, it has to be approved by a two-thirds majority in the German Parliament, which is difficult to achieve if parties do not agree on the necessity of a basic income regime.

In order to implement a UBI, further legal issues have to be considered in order to protect citizens' legitimate expectations. A replacement of certain insurance based benefits (e.g. unemployment benefits) with a UBI that results in a lower payment overall might not be in accordance with several nation's constitutions, since recipients are entitled to a legitimate expectation of receiving a higher sum depending on their previous salaries (in Austria: Art. 7 B-VG, the principle of the protection of legitimate expectations, in German *Vertrauensschutz*[22]). That is why the implementation of a full basic income that also acts as, for example, unemployment benefits, cannot be justified for employees that have already "earned" their entitlement to a specific employment benefit rate for a specific period of time. To prevent a breach of the principle of the protection of legitimate expectations, the sum of a UBI has to be at least as high as previous unemployment benefits. Otherwise, the new legal situation can solely apply to a.) persons that are not yet part of the labor market or b.) persons that have already received their unemployment benefits for a specific period of time and thus are not/no longer entitled to entertain a legitimate expectation in that matter.

Similar considerations also apply to other contribution-based benefits such as pension. As a consequence, a simultaneous introduction of appropriate adaptation periods applying to the parties

concerned is necessary. However, transition periods for unemployment benefits solely have to comprise a short term since unemployment benefits are just granted for a few weeks/years (depending on national legislations, in Austria f.e. the period of entitlement is from 20 weeks up to 3-4 years depending on the recipient's contribution periods and participation in training). Regarding pension payments, on the other hand, longer-lasting transition periods have to be implemented, since – within the current system – people are entitled to them for a longer period of time. Consequently, they shall draw benefits for a longer period of time.

2.2. UBI and EU Law

According to a study on basic income conducted within the EU, about 64% of European citizens are in favor of a UBI[23]. However, the EU does not have the competence to implement a UBI, since decisions regarding social security systems are made by Member States according to Art. 153 (4) TFEU. Therefore, the EU can only suggest or invite Member States to evaluate and take the introduction of a UBI model into consideration. Nevertheless, through the implementation of a UBI at the national level, questions regarding EU law arise, since such a scheme has to be in accordance with certain social security rules that are linked to the free movement of EU citizens (Regulation 883/2004 and 987/2009 as well as Regulation 492/2011 and Directive 2004/38/EC). Among several others, the following questions have to be considered: Can a government entitle only its own citizens? Do there have to be other prerequisites for an EU citizen to be eligible in another Member State? Is such a payment exportable within the EU? In other words, assuming Finland implemented UBI for all citizens, is a Finnish citizen still entitled to receive it when moving to another EU-Member State? Further examination and interpretation of a UBI in light of the rules, and especially the judgments, of the ECJ will be necessary[24].

2.3. The Finnish Experiment

2.3.1. Background

In Finland, there has been a wide discussion on the implementation of a UBI for decades[25]. In 2015, plans to launch a study and research on possible ways for carrying out an experiment were part of the current Finnish Government's "Government Programme"[26]. Consequently, an interdisciplinary research group, led by Olli Kangas, the director of government and community relations at the Finnish Social Insurance Institution (KELA[27]), was assigned to work on four different models (a full UBI, partial UBI, negative income tax and other basic income schemes) to narrow done the scope of possible designs for a basic income experiment in Finland. Members of the research group included professionals and scholars from different universities (Helsinki, Tampere, Turku, Eastern Finland), the Finnish Innovation Fund (Sitra), Policy Institute Tänk, the Institute for Economic Research (VATT) as well as KELA[28]. The budget for the experiment reserved by the Government amounts to € 20 million[29].

Several motives for the experiment are mentioned by the Government, KELA as well as the research group, and are among others: The experiment examines the application of this alternative scheme, which implies the adaptation of the social security system to counter changes in the labor market such as new forms of self-employment, precarious work and zero-hour contracts[30]. Therefore, the introduction of a UBI is seen as a possible answer to the upcoming changes our working lives will experience, and consequently, as an instrument that can tackle the resulting problems. Within the current system, several means-tested benefits such as housing allowance, social assistance and labor market subsidies are paid on top of each other, and whenever a recipient of such benefits becomes employed, work does not pay because of marginal tax rates that amount up to 80-100%. In other words, people that re-integrated into the labor market lose the entitlement to parts of their benefits and thus, even though they started working, they do not end up with more money than through social benefits. Besides this issue, also referred to as the "incentive trap", bureaucratic problems that arise from short-term employment prevent recipients from re-integrating into the labor market due to a loss of entitlement for certain periods, or long waiting times until they are entitled to receive certain social benefits again[31]. Therefore, the experiment shall identify if an unconditional payment acts as an incentive to re-integrate into the labor market. Furthermore, a more and more bureaucratic structure within the Finnish social welfare system has built up over the years and therefore a reform is needed[32].

Through several microsimulations using different parameters (flat tax rates vs current tax rates, partial UBI of € 550 or € 750, replacement of certain social benefits, taking into account single parent vs two-adult households), calculations of the research group showed significant differences in each model and located many difficulties and issues that have to be dealt with within these sub models:

- A full UBI could completely reform the current social security system since it aims to replace a major proportion of all social benefits. However, because payments must be, at least, as high as earning-related unemployment allowances, as well as housing allowances and child benefits, governmental expenditure reaches an unaffordable level[33]. Findings regarding a full UBI scheme included potential weaknesses such as «possible work-disincentives, conflicts with earnings-related unemployment security, political controversies, high costs, regional differences in housing costs and possibly [a] lack of legitimacy»[34].
- Furthermore, according to the research team introducing a negative income tax is not preferable since a real-time national income register does not exist in Finland as of today (though one is in preparation by the Ministry of Finance and the Finnish Tax Administration and planned to be introduced in 2019); the same applies to introducing a model which is based on a Universal Credit (as there is in the UK).
- Another option examined by the research group was a participation income, a «basic income [that] would be paid conditional on participation»[35]. Even though such a scheme, which obliges every citizen to contribute to the society in order to be eligible for it (≠ unconditional), may receive positive resonance and therefore, its acceptance might be easier to achieve according to the research group, it is very hard to implement since governments would have to define which activities can constitute participation. It also requires administration and, in worst case scenario, could replace paid work or act as a disincentive to take on a real job, and thus does not contribute to the economy. Since the Finnish Government's experiment focuses on the question of whether a basic income can be seen as a (dis)incentive to take up a job, and whether it could lead to a social security reform through a reduction of bureaucracy, a combined experiment of introducing a UBI as well as a participation income, an instrument with conditional characteristics that requires a lot of administration, does not contribute to finding out the required information (see research questions, 2.2.2.)[36].
- Furthermore, the research team points out that it is impossible to examine all models at once, and that currently, a partial UBI scheme will be the most suitable instrument within the Finnish system since «it would also be possible to introduce the model gradually by adding benefits provided by KELA as part of basic social security»[37].

After the researchers submitted their report summing up their findings and recommendations, the Finnish Government adopted an updated version of the acquired partial UBI model and passed the act on December 13, 2016[38], which entered into force on January 1, 2017.

2.3.2. Key Features of the Launched Experiment

The aim of the pilot project is finding answers to the following questions:

- "How could the social security system be redesigned to address the changing nature of work?
- Can the social security system be reshaped in a way that promotes active participation and gives people a stronger incentive to work?
- Can bureaucracy be reduced and the complicated benefits system simplified?"[39]

The nationwide experiment designed as a partial UBI scheme and setup for two years was launched in 2017 and includes 2000 people (52% male and 48% female) who were selected through a randomized generator from the target population, which consisted of about 175,000 people. Out of all the participants, 87% had received labor market subsidies and only 13% had received basic unemployment allowance[40]. After the experiment, the results of the study group will be compared with the results of the control group, which consists of everybody that was not part of the study, especially in regards of different changes in employment rates[41].

The tax-free[42] partial UBI amounts to € 560 and payments will be made in advance on the second business day of each month by KELA. The target group consists solely of social welfare recipients (i.e. recipients of social assistance, unemployment benefits, etc.) at the age of 25-58. Those under the age of 25 and retired persons were not included due to the limited budget and the assumption that people under the age of 25 are still undergoing education. An expansion, as well as extension of the experiment, which is highly recommended by the research group[43] is not planned[44]. Since participation is mandatory[45], giving out a different amount of money (both lower and higher) than participants would get through social security benefits would not be in accordance with the Finnish constitutional right to equal treatment[46].

Generally, participants are obliged to take part in the experiment. However, if their individual situation changes (e.g. by entering the military or moving abroad)[47], their participation may be interrupted or terminated. In that case, they will no longer get

basic income payments, unless their circumstances change again. Additionally, they will not get replaced by new participants[48]. Furthermore, an "opt-out option" is only available to students. If one wants to begin studying, the person can either choose to drop out and apply for financial student aid or stay in the experiment and not be eligible for such aid[49]. Recipients of the UBI get notified through a letter and interaction with them is supposed to be kept to a minimum in order to influence their sociological behavior as little as possible[50]. The main aim is to find out if a UBI can be seen as an incentive to take on a job since bureaucratic and monetary disincentives are at least partly removed. If a participant takes up a part time job, he still receives the full amount of the basic income (€ 560), which is tax-free, and the participant only has to pay taxes according to the current Finnish tax system. Introducing another tax system, which was part of the proposal made by the research group, was not implemented within the experiment[51]. According to a recent OECD analysis, if a UBI designed as it is for the trial right now – without changes in taxation – will be introduced on a national scale, such a scheme will be too costly and require additional tax revenue[52].

The partial UBI replaces certain social benefits including labor market subsidy, basic unemployment allowance, earnings-related unemployment allowance, (partial) sickness allowance, maternity, paternity as well as parental allowances and special care allowance up to the amount of € 560. In other words, participants receive a basic income of € 560 which then gets deducted from the after-tax amount of these social benefits. The remaining amount of these benefits still needs to be applied for and will then be paid to the participants. Several other benefits can still be claimed by the participants, such as housing allowance, because all additional benefits are not part of the experiment. However, certain social benefits (unemployment benefits, social assistance and housing allowances) a recipient is entitled to may be affected under certain conditions. If unemployment benefits exceed the amount of € 560 and recipients want to claim the difference, recipients still have to meet all requirements such as completion of status reports since qualifying conditions stay the same as before. With regard to housing allowances and social assistance, recipients that find a job and earn more than a certain amount of money may lose their entitlement to such benefits. Since social assistance counts as income in that specific case, a reduction up to 20-40% of the basic amount of social assistance may even be possible if one declines a job offer[53].

2.3.3. Positive As Well As Negative Aspects

Firstly, the experiment's nationwide and compulsory characteristics enable a more realistic view of sociological behaviors since it is not limited to certain areas and people while other trials like the recently launched pilot project in the Netherlands (Utrecht, Wageninen, Tilburg)[54] take place mostly at the municipality level and are based on voluntarily participation. Moreover, the introduction through compulsory participation schemes contributes to reducing potential bias to a minimum since voluntary participation in such a trial may influence the data. Furthermore, the selection is determined by a random generator. These three features combined reflect a natural cross-section of people within the chosen target group.

Another positive aspect is the governmental involvement before, during, and after launching the experiment, because it contributes to improve its clarity and enforceability. The fact that the experiment is carried out by KELA demonstrates high efficiency, since payments of social security benefits are in the area of responsibility of the very same institution and, therefore, there is no need to set up another bureaucratic structure.

However, even though the Finnish project stands out due to several combined unique features compared to other trials around the world, the following aspects let us doubt if the outcome of the current implemented trial will be transferable at all.

A key element of the experiment is that the specific target group consists of people who currently receive labor market subsidies or unemployment benefits. In other words, the pilot project comprises people that are not (or no longer) integrated into the labor market as of November 2016[55]. The research group admitted that it would be more beneficial to include various types of groups, but had to find a smaller range of people due to their limited budget[56]. If an instrument such as a UBI can be identified as a positive incentive for these people to take on a job, this would, indeed, be desirable to know. However, one should not forget to examine not just incentives, but also disincentives to work that might appear within such a system. This said, the chosen methodology is accurate to find an answer to the question of whether those people's motivation engages them to re-integrate into labor markets, but cannot examine possible disincentives to drop out of the labor market since the target group only comprises people that are unemployed and thus the employment rate can only increase, but not decrease during the experiment: Nevertheless, if this were carried out with the who-

le of society as a test subject, low-income employees might be affected by such an implementation in both a positive and negative way, while it is likely that high, as well as middle-income employees might not be affected by such an instrument since they do not seem to have a need for further incentives to take on a job (because they already have a sufficient job). As stated, the Finnish experiment is solely focused on people that are unemployed which is the reason that they can just be affected in a positive way, and the outcome of the research is therefore one-dimensional and very limited. This is why a study that focuses on low-income citizens would be favorable since it could examine the results in various ways[57]: How will they behave if they get an unconditional amount of money at the beginning of each month?

- Will they continue working for the same employer and thus stay in their job?
- Will they quit their jobs in order to take on another job that better fits their interests?
- Will a UBI affect them in such a way that they drop out of the labor market, because their fear of poverty was what kept them motivated before? Within a social security system based on a UBI scheme, the government loses the ability to pressure people that are unwilling to contribute at all since they are no longer obliged to demonstrate their ambition to reintegrate into the labor market. Whereas entitlement to unemployment benefits is not unlimited and unconditional in the current system and thus they at least have to try to re-integrate into the labor market.

These are just a few of the various questions that can arise and create different scenarios depending on the (so far) completely unknown behavioral impact since people have never been confronted to get social welfare with no strings attached. Social welfare is currently solely based on reciprocity (fulfilling certain requirements in order to be entitled).

Thus, in order to study a cross-sectional ranging behavior, it would be essential to include other earning groups since the implementation of a UBI might have not just neutral and/or positive impacts, but also negative ones. Therefore, despite the importance of the outcome of the current project, it is almost impossible to generalize sociological behaviors, if you take its limited scope into account. That is why the expansion of the experiment[58] proposed by the research team is, in our point of view, not just a positive development, but a necessary one, in order to get an accurate and more realistic picture. Olli Kangas, research group's team leader, made clear that the current experiment as it is being carried out "should be seen as the first step in a series of experiments testing various types of basic income." Unfortunately, an extension on the experiment is not planned as of today[59].

Yet, even after the expansion and implementation of a UBI scheme within the whole of Finnish society, other scenarios, such as the following have to be considered. Assuming that enough people are still eager to work, and the changes have in fact just created a shift from our social welfare system as we know it onto the next level of a modern social welfare system, one of the main questions to answer is who will continue to do less popular jobs, since economic dependency would not exist in the same way anymore? That is to say, who will do the jobs that are already characterized by staff shortages? Some of them can eventually be automated; however, it is impossible to find out which ones exactly, and perhaps it will be impossible to automate them all. Therefore, higher salaries are most probably the only incentive for employees to take on such jobs, which will result in a completely different salary expectation throughout labor markets.

Since the project had to be implemented in the existing social security system another problem regarding participants receiving a UBI instead of unemployment benefits is that for the outstanding amount (benefits exceeding € 560) they still have to get in touch with KELA to show their willingness to work. It is questionable if anything changes for those who received unemployment benefits before (13%) because in order to get as much money as before they still have to meet all requirements and stay in contact with KELA. Also for other participants, due to the fact that social assistance (payments one can apply for if other benefits do not cover all their needs)[60] gets reduced if one turns down a job offer, it is very likely that their behavior gets influenced. Consequently, people concerned would most probably take the job offer and their behavior will lead to higher employment rates. Therefore, the influence on participants' choices represents another limitation of the experiment.

Furthermore, since designed as a partial UBI, major parts of bureaucratic structures will be maintained in order to organize and administrate other benefits people can still apply for. Consequently, neither all disincentive aspects nor bureaucratic problems will be tackled in the experiment[61]. This was also stated in the research paper and discussed by Olli Kangas during the presentation of the project[62].

For these reasons, conclusions of the final outcome may only be transferable to other countries, if further steps such as an expansion of the target group and extension of the time limitation were planned to

be implemented. In times like these, it would be very interesting to find out, whether a UBI scheme had incentivizing effects to stay in[63] or re-enter the labor markets when people are no longer economically dependent on their jobs. Even if the outcome of the expected social behavior is negative (no change of the employment rate), information on how to reform current social welfare systems (especially those implemented in European countries because of their similarities) that require an outrageous amount of administration and, therefore, lead to a high bureaucratic burden, might be gathered incidentally. That is why the implementation of the Finnish experiment, its development and the findings should continue to be monitored closely by experts and professionals. However, looking at the concrete design of the currently implemented experiment, despite its unique characteristics one can argue if Finland trials a real UBI (especially when focusing on the chosen target group and the fact that social assistance gets reduced if declining a job offer).

2.4. Could a Similar UBI Be a Solution for Either Scenario?

Returning to the initial research question: Will the implementation of a UBI scheme be the solution for either *Scenario A* (assuming most jobs are automated in the future) or *Scenario B* (assuming that this is just a new era of newly created jobs)? Even though there is an ongoing debate about basic income schemes, the answer of whether their implementation can be the solution to the problems that arise from either scenario is hypothetical since there is no evidence so far.

Due to the principle of legitimate expectations of citizens, such a scheme cannot apply to citizens that have the right to receive a certain amount of benefits, such as pension payments or unemployment benefits, if it replaces these benefits and amount to less than the benefits they are currently entitled to. Other legal concerns can be found at the implementation level depending on competences and the type of legal act which can introduce such a scheme. However, as discussed previously, a UBI scheme that results in the replacement of all other benefits that are currently granted by welfare states might infringe upon respected European values (whereas in some countries such a scheme might even result in a breach of the principle of equality). That is why solely a UBI in combination with certain additional means-tested benefits (i.e. the European social welfare approach) in case of illness, disability, or old-age may be in accordance with these political commitments. This said, health care systems as well as certain subsidies for persons concerned should be available. Nevertheless, whether a UBI or means-tested social welfare is more suitable for society is a political choice that has to be made by national governments, since both are simply different approaches to ensuring some kind of minimum security.

Positive effects of an unconditional payment include that there would no longer be any kind of waiting time and recipients would benefit from it at the beginning of each month. Furthermore, it would be impossible for someone to fall through the cracks in the system, and people would be able to spend their time more efficiently since they would not have to fill out one form after another. Another advantage of such a scheme, also stated by the research group, is that introducing a UBI may be cost-neutral since bureaucratic costs can be reduced to a minimum. With regards to this, one should also consider the possibility of automating administrative processes. Then there would be no need for reducing bureaucratic costs through changing the entire system, since cost savings might be achieved through automation instead. It seems a little ambivalent to talk about a possible mass unemployment due to technology, but to not think about the possibility of automating substantial parts of social welfare's bureaucracy.

Furthermore, it is doubtful whether a UBI could be funded at all in both scenarios, since governments certainly lose a significant sum of money to people that do not need to receive government benefits. Additionally, not every seemingly equal scheme ensures and promotes real equality. That is why, another point of critics is whether a UBI scheme is suitable at all, because instead of the distribution of a certain sum of money to every citizen, the money could be used to take targeted measures for people in need. Consequently, it really depends on its concrete design and implementation whether such a scheme contributes to more equality[64].

One very interesting aspect of introducing a UBI is whether an unconditional, guaranteed financial security standard can be seen as an incentive for a jobless person to work. Therefore, findings regarding changes in employment rates within the Finnish experiment (however, only if the target group got expanded) matter differently since there is no certainty regarding which scenario will occur in future. Within a world of mass-unemployment due to the rise of robots and AI (*Scenario A*), findings about incentives for people to take on jobs are irrelevant to a certain extent, since there would not be enough jobs available for everybody. In the case of *Scenario B*, a UBI scheme could be beneficial for persons that ha-

ve been trained in skills they no longer need, since they would be able to live off the basic income while they get trained and re-educated without requiring a lot of administration from the state. However, some people in this situation might not see a need to be re-trained and might thus drop out of the labor market. Therefore, whether a UBI promotes (dis)incentives, plays a role in the transition period (of an old educational system to an updated educational system) as well as in a *Scenario A* (since half of the people will still be working), and will hopefully be determined through the results of the Finnish trial.

Aside from the above, several changes that have already taken place within our labor markets and are very likely to expand, also within both scenarios, include piecework platforms (so-called crowdwork) as well as a huge start-up scene. The latter shows a boom for entrepreneurs which is also linked, both directly and indirectly, to technological advances. If there were less jobs, but the economy created more and more possibilities for entrepreneurs, it would be very beneficial to have, instead of several different/similar benefits, one benefit everybody is eligible for right away without having to deal with lots of bureaucracy. However, problems arising from bureaucracy might also be tackled through a reform of our current social welfare systems, as stated previously.

All in all, a UBI can definitely be one, but in our opinion not the only, way to react to problems arising from new technologies. Of course, if *Scenario A* occurs and mass-unemployment is the result, a social welfare system that is mostly based on reciprocity is unsuitable since people cannot contribute to the system as much as they do now. However, a general reform of current welfare systems, in our point of view, might be the best solution and comprise the use of the advantages that would result from automation in order to reduce bureaucracy, and downsizing complicated structures (including several different benefits that you have to apply for individually and slight differences in their eligibility criteria) through bundling certain benefits to a single payment without entitling every citizen to a certain sum of money right away. Measures like these might ensure general security regardless of the changes that occur in the 21st century.

In the end, if *Scenario A* becomes reality, it might be more beneficial to focus on how to raise revenues in order to maintain social security in general. On that basis, an economic transition in the way we finance current social security systems is inevitable and must be established through the implementation of new tax regimes. An analysis of those that are currently being discussed occurs below.

3. Second Part: The Relevance of Taxation

As previously underlined, according to economists, the impact of the fourth industrial revolution on the labor market could lead to two outcomes, which we have indicated in the introduction as *Scenario A* and *Scenario B*.

On the one hand, in relation to *Scenario A* it is easy to see that it will be necessary to review states' current public financing systems in order to provide the same level of welfare if tax on wages and social insurance contributions disappear together with the old jobs. On the other hand, in relation to *Scenario B*, solutions effective in the short term might be sufficient in order to cope with the unemployment of the generation hit by the change, but further attention should be paid to training and education. In order to achieve a welfare state, whether designed in the current form or, possibly, with a UBI system, tax law will play a fundamental role. Some governments and international institutions have already realized its importance and started to suggest possible solutions[65].

Over the last year, "Robot-tax" has been a buzzword within Europe, especially due to the release of the draft report presented by the European Parliament's Committee on Legal Affairs, which called on the European Commission to explore the implications of possible legal solutions when carrying out an impact assessment of its future legislative instrument, which would include «creating a specific legal status for robots, so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons with specific rights and obligations, including that of making good any damage they may cause, and applying electronic personality to cases where robots make smart autonomous decisions or otherwise interact with third parties independently»[66].

This statement led to a lot of hype around the possibility of implementing a "Robot-tax", since robots were given "rights and obligations", which would include contributing to the economic and social functioning of society[67]. Nevertheless, this "legal status" was no longer present in the text of the report which was voted on by the plenary of the European Parliament on February 16, 2017. Moreover, after Bill Gates also underlined the possibility of introducing a tax on robots, this possibility has never been as

promoted. However, taxation instruments related to the implementation of new technologies were already the object of discussion at the national level (e.g. the Austrian *Maschinensteuer*[68]) in the past and are still going on[69] and seen as possible solutions to the forthcoming fourth revolution[70].

Another proposal to raise enough revenue to cope with the possible lack of tax on wages is connected to the issue of environmental protection. Broadly speaking, a higher level of technology use is usually combined with a high level of energy consumption. Consequently, the adoption of green taxes may be able to tackle two problems, the need of revenues and the need for environmental protection.

3.1. The European Parliament Resolution on Civil Law Rules on Robotics

At the European level, the debate around the possible implications of automation in the labor market started to arise particularly after the publication of the first draft report presented by the Committee on Legal Affairs of the European Parliament containing recommendations to the Commission on Civil Law Rules on Robotics[71]. The report's aim is to address the most important issues arising from the ever wider presence of robotics in our society. Another version of the report was adopted on the January 27, 2017 before being voted on by the plenary of the European Parliament on the February 16, 2017 and becoming a resolution. Just by focusing on the issue of a possible high level of unemployment as a result of automation (*Scenario A*) and the implications in relation to tax and social security matters, we can clearly see that between the proposed report and the adopted text of the European Parliament's Resolution there is a huge discrepancy. In the first version presented by the Committee there was an express reference to concerns about the viability of the social welfare and security system if still based on our current tax system. Furthermore, rephrasing the Committee's words, for the preservation of social cohesion and prosperity, they invoke the need to take into consideration the possibility to levy a tax on the work performed by a robot or a fee for the use and maintenance of robots for funding the support and retraining of unemployed workers whose jobs have been reduced or eliminated[72].

The Committee also highlighted how the difference between the creation and loss of jobs could impact the financial sustainability of social security schemes, pension systems and unemployment insurance systems of Member States, and how, at the same time, a loss in both medium and long term employment could have consequences on consumption capacity. Moreover, in the Opinion of the Committee on Employment and Social Affairs regarding the Report, it is stressed that higher levels of automation shall not be seen as beneficial only in light of cheaper labor costs and improved levels of speed. Therefore, the Committee on Employment and Social Affairs called on the Commission and the Member States «to explore the possibility of introducing a notification system prior to the establishment of robots and their relative participation to the companies turnover for the purpose of taxation and social security contributions»[73].

If we analyze the Resolution passed by the plenary, we now see that there is no mention of the tax issues arising from the consequences of automation in the labor market. The approach preferred by the plenary is then to generally call on the Commission to «start analysing and monitoring medium- and long-term job trends more closely, with a special focus on the creation, displacement and loss of jobs in the different fields/areas of qualification in order to know in which fields jobs are being created and those in which jobs are being lost as a result of the increased use of robots;»[74] and «Highlights the importance of foreseeing changes to society, bearing in mind the effect that the development and deployment of robotics and AI might have; asks the Commission to analyse different possible scenarios and their consequences on the viability of the social security systems of the Member States»[75].

We can certainly see that the concern around these topics, even if diluted in comparison to the first draft, is still on the agenda of the EU and the discussions also at the national level have just begun. Nevertheless, it emerges that the European Parliament was not yet brave enough to actually start a concrete debate on these issues at supranational level, which, sooner or later, will have to take place[76].

3.2. The So-called "Robot-tax"

As previously described, the European Parliament's Resolution does not directly refer to a "Robot-tax", nor does it provide for the possibility to give rights and obligations to AI, or state which measures Member States or the EU should take in order to cope with these problems. Some confusion also emerges as to how governments and future presidential candidates are picturing a taxation instrument to which they refer to as "Robot-Tax"[77].

Even before starting to design a possible "Robot-tax", it is essential to note once again that the technologies that will be taken into examination as replacing human labor and which are relevant for the purposes of this paper are only the ones related to AI.

In order to analyze whether a tax on AI ("Robot-tax" from now on) might be a proper instrument to deal with these challenges or not, it is necessary to try to define it and describe the proposals related to this catchy word which have been suggested so far. According to Weissman, a tax on AI could be drafted in two different ways. The first one would mimic the current employment-based tax system we have used so far. In other words, what the employer has been paying on behalf of each employee should be paid for each AI replacing the human work force. This also seems to be in line with the proposed Report presented by the Legal Committee, which considered the option of levying a tax on the work performed by an AI. The second possible tax instrument would consist of replacing the tax on wages by taxing the economic value obtained by the use of AI, using as the tax base facts directly related to the machine (e.g. the costs of technology)[78]. Both types need to be analyzed more in depth, but in order to proceed in this direction we will briefly recall some basic elements of public finance and social security financing. In order to ensure the running of a welfare system, two are the instruments which are typically used: social security contributions and taxation. Both instruments are public levies based on legal acts, which are mandatory, but they have some typical distinctive features. In fact, social contributions consist of a social insurance relationship between the insured person (employee) and the social insurance institution and, contrary to taxes, within social security there is a direct connection between the duty to pay the contribution for the insured one and the duty to provide the benefits of the insurance institution. Differently, drawing a separation line between these two concepts by focusing on the purpose is not always so easy since these two instruments are not mutually exclusive. In fact, while it is possible to define as social security the social policies directed at the protection of a person during their various life stages, the main aim of taxation is collecting the money necessary for the state to perform activities, which do also include social policies[79].

However, by referring to the nature of social contributions in the traditional sense, even if AI was entitled to have rights and obligations, it could be difficult to state that AI shall have the obligation to pay social contributions for a service they will not receive in return (e.g. sickness allowances, invalidity allowances).

Providing services falling under the definition of a welfare system is therefore put in jeopardy in both cases of long-term and short-term job losses, since both social security contributions and taxes are calculated on the basis of the wages of employed persons.

3.2.1. The "Robot-tax" As a Mimic of the Current Employment-based System

This type of solution will require considering AI as part of the human workforce, and, consequently, to apply the same system as if humans were still working. This means that the employer would have to pay social contributions and tax on wages for each AI.

With reference to this proposal, the first problems we encounter are related to the fundamental elements of a tax: the tax base and the ability to pay principle. First of all, income tax in general is based on the income imputable to an entity, whether this is a physical person or a legal person. In particular, the tax base for tax on wages consists of the income derived from employed work. If no form of legal status, as we know it or in a different way, is given to AI, then no income would be attributable to this technology. Moreover, in regards to the ability to pay principle[80], according to which the economic contribution of taxpayers is based on a fact of economic relevance, the question that arises, in relation to a "Robot-tax" of this kind, would be: who is the subject whose economic capacity to contribute is being taxed? In relation to the tax on wages, the ability to pay principle refers to the incomes that result from the employed work of an employee. However, AI does not have any income to which we could anchor their ability to pay.

Even if we try to levy a fixed tax on each AI that has substituted a human employee, there will still be some relevant differences which should be taken into account. One of the first problems is to assess in every concrete case how many humans are being replaced by that technology or whether AI has just been added to the human workforce as a result of growth[81]. This type of examination could easily be done on already running businesses because it would be possible to examine how many employees are being dismissed as a result of the AI, but could be more complicated for new businesses and in certain sectors (such as those characterized by a higher level of learning engagement or human approach, e.g. lawyers or doctors).

Furthermore, a tax on wages is designed in countries like Italy as an "all-inclusive" tax, meaning that the tax base includes all the remunerations related to that particular working relationship. This means that indemnities, promotions, and extra-working hours also fall under the tax base[82]. Normally, therefore, the tax base tends to increase as the years pass, which cannot happen with AI since they do not get these kinds of benefits. The result would certainly not be convenient for states' revenue compensation.

Also, with regards to extra working hours, these will not be taken into account anymore in determining the tax base due to the fact that we are talking of machines that do not have the same human needs and therefore do not require certain working conditions. Even if we delimitate the working hours with a certain tax base and then raise taxes with a higher tax rate for the extra working hours, this would create some difficulties in the assessment for the tax administration. Moreover, for AI there is no interest (contrary to what happens with humans) to claim the extra hours worked, unless we recognize AI also have the ability and right to protest for their own interests (in this case, we should then expect thousands of machines to march on the streets).

A possibility which might be taken into consideration is to adopt a sort of "electronic person" premise for AI, granting rights and obligations, as emerged from the first draft proposal of the European Parliament[83] and as highlighted also by Oberson who sustains that robots should be considered as taxable persons[84]. In tax matters, it would not be the first time that a certain status would be attributed to assets or group of assets for their particular ability to generate profits.

As suggested by Rapporteur Mady Delvaux[85], this legal status would be comparable to the status given to companies. From a tax perspective, the relationship between the owner of the rights on the AI and the AI itself could therefore be compared more or less to the one between a company and its shareholders. In this case, no new tax would be needed, but rules governing the relationship between companies and their shareholders would be applied. The taxes that will be levied will depend on the legal form of the AI's owner. If it is a corporate body, then a corporate income tax will be levied, if it is a partnership, then profits are attributed *pro rata* to the partners and the partners will then each have to pay income tax according to their respective shares in the company (AI).

Nevertheless, defining the quantum attributable to the AI might be a difficult task since they might be used in complex productive cycles. Moreover, the real issue is related to the consequences the adoption of such a legal status might have in other legal disciplines, e.g. adoption of a legal status in civil law for liability matters.

3.2.2. The "Robot-tax" As a Tax Based on the Costs of Technology

International institutions, such as the United Nations Conference on Trade and Development, in analyzing the impact of robots and industrialization on developing countries, have highlighted the need to levy taxes on robots as capital equipment. In their opinion, high tech industries would then be able to support low-skilled and medium-skilled workers made redundant by technology and ensure the maintenance of their living standards[86]. In this proposal, the possible suggested tax base would consist of the cost of the technology or other bases which are not directly related to who/what is doing the job.

By trying to examine this tax proposal, it is then necessary to examine the "tax base element". In this case, if we take into consideration the costs the entrepreneur has sustained by buying the technology, one of the main issues is related to the fact that the tax would decrease with time because of the amortization of the costs over the years. If in the first year, a tax is levied on the costs reported on the balance sheet, over time the value of the AI decreases and so does the tax on its costs. However, as already described above, taxes on wages tend to increase over the years. This means that there will still be consistent losses in revenues unless the tax rate rises with the decreasing of the costs, and this would be justified by the assumption that in the first year the technology would not be able to generate the same profits as when introduced. Nevertheless, this last option is also easily criticizeable since this is not always the case.

Another difficulty highlighted by Weissman was the need for new information reporting to the tax administration[87]. On this point, in the current income tax reporting system it is possible to deduct entrepreneurial goods, it should therefore not be hard to understand the costs of the technology, especially because it is also in the interest of the entrepreneurs to deduct these amortization costs.

Nevertheless, forms of control will also be very difficult to implement, since in the case of technology such as software, it will be very hard to control and can easily lead to the evasion of such taxes, especially if software is developed internally. Taking into account the costs of the technology, but more in general trying to tax the use of technology as part of

business capital, will also mean the abandonment of the withholding system, which does not allow the tax administration to have constant revenue flows. Even by changing the tax base this last problem will still remain.

Moreover, it should be taken into account that, as happened with every other technology, the costs of AI will become cheaper in the future. For this reason, it is questionable whether the amount of revenue raised by using AI costs as a tax base would be able to replace the financial resources that would be lost in the long-term jobs loss scenario (*Scenario A*).

3.2.3. The Austrian Maschinensteuer and the Italian IRAP

Another proposal linked to technology displacing human labor uses as a base the added value to profits obtained by businesses considering a rise in their profits due to the implementation of new technologies. This is not very far from what was suggested in Austria for the funding of part of the social security system. What has been the object of strong debate in Austria in the last year is the so-called *Maschinensteuer* or *Wertschöpfungsabgabe* (from now on tax on the created value)[88]. The fact that this tax, which will be further described below, is known by two names is due to the premise that has been used to justify the need for such an instrument. The introduction of this tax was suggested by the governing left wing party in summer 2016 as a partial solution to the possible loss of revenues that would result from higher unemployment due to the higher automation of companies, which would also increase the profits of companies using new technologies[89]. For this reason, the type of tax proposed by the government would not directly target the technologies themselves; it would target the result of their implementation.

The proposal of a tax on the added value is not new in Austria, since Prime Minister Dallinger, already in 1989, proposed a tax on the created value. From its proposal and as generally intended, a tax on the created value consists of a public levy for social contributions that does not take as a tax base the wage sum of the work but the entire total added value of a company. Therefore, the efficiency of the company is to be evaluated on a wider graduated scale, not just on the basis of the wage sum. The added value of a company should then result, according to the 1989 proposal, not only from the wage sum but should also include depreciation, profits, borrowed capital, rent and lease and would therefore broaden the tax base[90].

As mentioned above, in summer 2016, the Government started to reconsider the introduction of such a tax, and in the so-called "Plan A"[91] presented in January 2017 by the Prime Minister there is now a clear example of how this tax could be implemented by starting at first from a single social fund, the so-called *Family Loan Compensation Fund* (*Familienlastenausgleichsfonds*, FLAF). The FLAF is currently financed through a withholding of 4.1% of the monthly salary of employees[92], while with the shift to a created value tax the company would be paying 3% of the base of the net created value. This might be seen as a kind of mini-value-created tax sample. Furthermore, after criticism received in the past few months, the program foresees an exemption for single-owner companies.

One of the main criticisms of this proposal is that the effects of this new tax will be different within different sectors. Professions such as lawyers, tax consultants, doctors as well as banks and wholesale trade might lose in this system conversion. From another perspective, it is undeniable that every tax policy intrinsically has its winners and losers. Moreover, the administrative costs of collecting an added value-tax would be higher in comparison to that of the tax on wages. Since the information on a company's created value is not available on a monthly basis, but only after the end of the accounting year, the value added tax would therefore be paid in retrospect, including regular advance payments and a subsequent final statement[93]. Similarly, the continued existence of long-term employers' contributions and a created value tax in the case of a partial reform would increase the administrative burden on taxable enterprises and the tax administration[94]. Furthermore, wages should not be taken into account in the tax base, if the purpose of this tax is to rebalance the tax burden and to ensure a welfare system that is at risk due to automation.

What is interesting within the Austrian debate over the proposal of a created value tax, is that the Italian IRAP (regional tax on productive activities), a regional (local) tax instrument, is often mentioned[95]. A short overview of this tax could be useful to understand how a "Robot-tax" based on the created value of an entrepreneur might look in concrete terms, and it would be possible to see how constitutional and EU law issues related to this tax were solved. This tax was introduced in the Italian legal system in 1997 in order to give Regions the possibility to finance the health care system. The assessment and collection of the tax are prerogatives of the State, while the revenue goes directly in the Region's treasury. A prerequisite of IRAP is "to be carrying out

an economic activity autonomously organized for the purpose of the production of services and goods"[96]. Within the definition of "economic activity" it is possible to individuate three different categories of passive tax subjects such as entrepreneur, liberal professions and administrations (IRAP is in fact levied also to organs and institution of the State, Regions and municipalities). Nevertheless, occasional employees, forestry entrepreneurs, hedge funds, pension funds and European economic interest groupings are exempted[97].

The tax base is given by the "net production value". For capital companies and commercial entities this tax base consists of the difference between the values and costs of production as shown in a company's statutory financial statements, excluding items like labor costs, write-downs to fixed assets and receivables, and risk provisions. Over time, the criteria to calculate the tax base have been raised in order to reduce the penalizing effect that they had on highly-labor intensive companies. For partnerships and individual entrepreneurs the positive components of the tax base are profits and inventories. It is possible to deduct the costs of rough materials, of goods, services, amortization and lease prices. Different modalities to calculate the tax base are also provided for agricultural entrepreneurs, banks, and financial and insurance institutions. For autonomous workers, the production value is given by the difference between remunerations and the sum of the costs and of the amortization in relation to a certain tax-period. Non-deductibles are passive interests and expense for employees. For non-profit entities and public administrations the tax base is given by the expenses of the wages. The tax rate is set at 3.9%[98].

What was a strong object of debate in the Italian experience in regards to IRAP was the constitutional justification of this tax[99]. In fact, on the one hand the prerequisite of IRAP is to carry out an autonomously organized economic activity. On the other hand, in order to tax this activity the parameter that has been adopted is not one of the traditional ones used in accordance with the ability to pay principle (wealth, capital, income, etc.) but is an economic measure, that is to say, the net production value. This is obtained from the difference between the value and the costs of production with some other costs such as those related to labor and interest that are added. The Italian Constitutional Court was asked whether the net value of production was a parameter that complies with the constitutional ability to pay principle due to the fact that IRAP is not levied on a final economic result[100]. However, the Court agreed that the net production value is representative of a new wealth produced by autonomously organized economic activity based on their production factors and able to constitute an ability to pay index[101].

Lastly, the possible breach of the European provision forbidding Member States to enforce levies that are substantially a duplicate of VAT has also been dismissed. On this matter, the ECJ gave a negative opinion. It stated that IRAP in fact differ from VAT since it is not characterized by being proportional with references to the price of goods and services provided by the passive subject, nor must it be transferred on the final consumer[102].

A tax on the created value might be an effective solution, but wages should certainly not be part of the tax base. Furthermore, factors like tax competition among states and how the tax base and rate will be designed in order to avoid discouraging innovation investments will play a fundamental role. Moreover, there it is quite complex to design the tax base taking into account the different business activities and the impact of innovation on them.

3.3. Other Taxation Instruments As Alternative or Complementary Solutions

To raise the necessary revenue to keep a welfare state running, other proposals can be taken into consideration. One suggestion has been to increase energy taxes or to introduce new ones, since it is possible to assume that the more companies substitute human workforce through AI the more energy they will need[103]. The increasing use of AI will in fact automatically lead to a higher consumption of electricity, with the risk of fewer possibilities for a state to fulfill its international and national environmental commitments. With regards to this problem, the introduction, or raise, of energy taxes could be beneficial for various reasons. On the one side, it would be possible to restore the amount of revenue necessary to ensure social care, education, and all the social assistance benefits that the state would lose due to a possible decrease of proceeds from taxing wages. On the other side, these taxes would push entrepreneurs who benefit from the work of AI to increase their use of renewable energies.

Taxation, in fact, has been recognized widely in literature as one of the more efficient instruments to reduce pollution and drive consumers' behaviors while also being an instrument that is able to raise significant revenue[104]. Furthermore, as underlined in a taxation paper by the European Commission, one of the basic ideas behind green tax reforms has been the possibility to use the revenue obtained in

this way to reduce other taxes such as the tax on labor. An example of a country that introduced green taxes and was able to reduce the tax on wages is Sweden. Starting from these premises, which are based on economic studies, it seems that this type of taxation could be a suitable instrument for trying to cope with the issues rising from the fourth revolution in terms of revenue losses.

Nevertheless, if successful in what should be their primary goal, in other words, if they are able to shift the entrepreneurs' choices to use renewable energy instead of non-renewable energy, the revenue raised through these tax instruments would be limited to a certain period of time. In addition, a negative characteristic of environmental taxes levied on goods is that they will put a disproportionate burden on low-income households. Even if a study of the European Commission highlights how the recycling of tax revenues through the reduction of income taxes or social security contributions might mitigate the regressive impact of green taxes, it does not seem to be an affordable solution if the main aim of these taxes in the future is to fill the gap left by the loss of revenue from a tax on wages[105].

Differently from typical measures, since they have an implication in the environmental sphere, these taxes need to cope not only with tax law principles (e.g. the ability-to-pay principle) but also with environmental law principles such as the precautionary principle and polluters-pay-principle. Moreover, at the European level what makes these measures particularly difficult to adopt is that the introduction requires the unanimous vote of the European Council, which is different to what happens with environmental command-and-control instruments. They also interfere with the Common Market and they might create problems in terms of competition[106]. In particular, in cases where a country unilaterally introduces taxes on industrial inputs, this could lead to a strong competitive disadvantage for local firms, which could therefore push companies to relocate elsewhere, and for the purposes of this paper will mean a loss revenue.

Furthermore, if we take a look at recent bitcoin-mining activities, due to the high energy consumption, many miners have already moved to countries where energy is renewable and cheaper[107]. Since the mobility of technology and the fact that there will be no need to take labor costs into consideration due to the replacement of the human workforce with AI, the possibility for companies to migrate to the most convenient tax spot will be even easier than in the past.

Another proposal is an additional, or an increase in, consumption tax[108]. However, even if it is said to be easier to implement and could provide a constant cash flow to a state's revenue, this measure would just increase the tax burden on consumers, who would be the most impacted by the job losses if we focus on the long-term *Scenario A*. For this basic reason we decided to leave this taxation instrument outside the scope of the paper.

3.4. Will Either of the Discussed Tax Measures Be the Solution?

From a tax perspective, in order to grant the current level of welfare (whether through a basic income or the traditional system) we tried to point out the different instruments that can be useful in *Scenario A* and *Scenario B*.

Starting from the green taxes, as tempting as they seem from the possibility to kill two birds with one stone, they would not be able to sustain a state's finance for long, in order to maintain a welfare system like our current one. In fact, the introduction of environmental taxes, if successful and able to reach the main goal of shifting energy consumption from non-renewable to renewable resources, would have the potential to raise revenue only for a certain amount of time. It would then be necessary, after a short time, to think again of new tax instruments to raise the needed revenue, and would simply consist of the postponement of a problem which will still need to be solved later on. For this reason green taxes could be a measure helpful only within *Scenario B*.

Regarding *Scenario A*, we tried to highlight the pros and the cons of the different proposed "Robot-tax" solutions.

- A proposal considering levying a tax mimicking the income tax on wages is unfeasible due to the fact that no personal income is attributed or given to the AI, raising problems also with regards to the ability to pay principle.
- If we opt to give a sort of legal status to the AI and consider its relationship with the owner of the rights to the AI as that between a company and its shareholders, then taxes will be levied depending on whether the owner is a corporation or a partnership. In this case, the main issues related to the adoption of such a measure are the fact that it might be complicated to individuate the amount of profits to attribute to the AI, as well as the consequences that giving an AI a legal status would have in other legal fields.
- Even the proposal of a "Robot-tax" based on the costs is surrounded by several issues, such as the relationship between the tax rate to apply and the fact that the costs (which consist of the tax

base in this proposal) will decrease due to amortization and depreciation, and the difficulties of enforcement for tax agencies.
– Lastly, we analyzed the possibility of a "Robot-tax" based on the created value. At the moment, there are discussions in different EU Member States on the adoption of such a measure. In Austria, the debate around this tax often refers to the Italian example of a tax on the created value (IRAP, as described in paragraph 3.2.3.), which was introduced with the aim of substituting different minor taxes and financing part of the healthcare system. Nevertheless, IRAP was not introduced for the substitution of a tax on wages necessary to deal with revenue losses due to unemployment driven by new technology. Regarding this last point, if this tax were adopted when *Scenario A* had not yet taken place, and long-term employers' contributions were still in force, this would just represent an increase of the fiscal burden on taxable enterprises as well as an additional administrative burden for companies and for the tax administration. Consequently, it could push companies to migrate to other countries that had not adopted such fiscal policies. For this reason, we believe this instrument should be introduced only when *Scenario A* is very likely to happen, since it could function as a measure to substitute the tax on wages. Aware of the fact that, differently to the tax on wages, the burden would be on the employer, it would still benefit from the shift from a human workforce to an AI workforce in terms of earnings. Nevertheless, we recommend an analysis of economic studies aimed to individuate the proper tax base and tax rate when designing this type of tax, which should be able to prevent discouragement in terms of investments and implementation of innovation.

Moreover, there is also another very important point that should be taken into account and that we cannot afford to leave out especially by observing the current tax avoidance scheme panorama. When talking about AI, we refer to economic activities that can be carried out anywhere in the world. When cheap labor is no longer a factor that acts as a trigger for companies' migration, a country's attraction towards enterprises will be based almost exclusively on tax measures adopted at the national level.

National legislators, in adopting their chosen tax policy to cope with the fourth industrial revolution, have to pay particular attention to what has been adopted in other states. The risk we could otherwise encounter is to foster harmful tax competition[109]. For this reason, once again, we support the need of a certain level of harmonization[110], even though we realize the difficulties of achieving this at a global level (especially by taking into account that relationships between states from an international law perspective are governed by soft law).

4. Conclusion

In this paper we analyzed useful instruments to cope with the effects of AI on labor markets. As emerged, we focused on measures that could be taken into consideration in *Scenario A* (long term mass unemployment) due to the fact that it requires more adaptations from a tax and social security perspective.

As discussed in the first part of the paper, legal concerns arise at the implementation level (type of regulation, competences and the principle of the protection of legitimate expectations). Therefore, introducing a UBI is, in the end, primarily a question of political decision making, in terms of deciding which legal philosophical approach should be pursued when thinking of social security. Should social welfare still serve as the last resort and focus on targeted support? Or should it ensure minimum standards for everybody unconditionally and regardless of an individual's need? Even though the introduction may be in accordance with many national constitutions (depending on national interpretations of the principle of equality), the concrete design of a UBI matters if we take European values into account that deeply focus on solidarity (ESC, Art. 2 Lisbon Treaty as well as Art. 34, 35, 26 CFR). However, such a combined scheme would require a lot of revenue and, therefore, it is questionable whether it is affordable, since governments would certainly lose a significant sum of money in favor of people that do not need to receive government benefits; this needs to be evaluated further by economists.

Nevertheless, if the outcome of the, Finnish experiment shows significant changes within employment rates and, therefore, introducing a UBI leads to incentives to take on a job/start a business, we will have to return to this issue and discuss it further based on concrete figures, since a UBI might affect the economy in such a positive way that the loss of money to persons that are not in need is irrelevant compared to the positive impact on the economy (especially within *Scenario B*, but also *A* since half of the people would still be employed). However, unfortunately, neither an extension nor an expansion of the experiment will probably take place and therefore it is very unlikely that the outcome will show transferable results due to its limited scope.

From a tax perspective, in the presence of *Scenario A*, in alternative to recognizing the status of "taxable person" to robots – as already suggested by other scholars[111] – taking into account the issues above described, a "Robot-tax" based on the created value or on the costs of the technology might still be a viable option in order to substitute the revenue which would be lost as a result of AI not paying a tax on wages, and that is necessary in order to sustain a welfare system. However, this last solution also presents several difficulties in its drafting and implementation. In the design of these measures it will be necessary to balance the tax base and the tax rate in such a way that discouraging innovation is avoided. Furthermore, within a global playground, the introduction of this kind of instrument by a single state might have significant negative impacts like pushing companies to countries where the tax burden is less heavy and thus, would foster tax competition among states. For this reason, harmonized measures would be preferable.

Nevertheless, to us it seems more likely that *Scenario B* (newly created jobs) will be the reality in the future since there have always been changes within the labor markets due to innovation, and we believe that measures to face the challenges of AI should also take regard of other aspects not directly related to social security systems and tax instruments. As pointed out by the OECD, real concerns should arise in relation to our educational programs, which should prepare us for the skills required in the 21st century economy[112].

Note

[1]A first draft of this paper was presented by both authors at the WeRobot 2017 Conference (Yale Law School, March 31-April 1, 2017). The authors are very thankful for the feedbacks and comments received by the participants and in particular by the discussant Prof. Brishen Rogers, and would also like to thank Prof. Tina Ehrke-Rabel and Prof. Beatrix Karl for their support.

[2]K. Schwab, *The Fourth Industrial Revolution*, World Economic Forum Publication, 2016, 11 p.

[3]C.B. Frey, M.A. Osborne, *The Future of Employment: How Susceptible Are Jobs to Computerisation?*, Oxford, Oxford Martin School, 2013.

[4]See http://bruegel.org/2014/07/the-computerisation-of-european-jobs.

[5]Their paper also includes a table of 702 occupations and estimates the probability of computerization individually for each occupation.

[6]E. Brynjolfsson, A. McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, New York, W.W. Norton & Co Inc., 2014; M. Ford, *Rise of the Robots: Technology and the Threat of a Jobless Future*, New York, Basic Books, 2015, 61 p.

[7]D.H. Autor, *Why Are There Still So Many Jobs? The History and Future of Workplace Automation*, in "Journal of Economic Perspectives", vol. 29, 2015, n. 3, p. 3-30.

[8]OECD, *Policy Brief on the Future of Work – Skills for a Digital Age*, OECD Publishing, 2016.

[9]T. Fitzpatrick, *Freedom and Security: An Introduction to the Basic Income Debate*, Basingstoke, Palgrave Macmillan, 1999, p. 3 ss.

[10]See https://www.theguardian.com/business/2016/jun/23/universal-basic-income-could-be-the-best-way-to-tackle-inequality.

[11]Trials have for instance already been carried out in the US during the 1970s, in Canada (Mincome 1974-79), in Brasilia, in Belgium and in different countries in Africa as well as India (2010-2013). Recently there has been a referendum in Switzerland whether a UBI should be implemented. The results showed that about 77% voted against an introduction; all around the world basic income is part of the political debate due to the rising technology.

[12]European Union, *Charter of Fundamental Rights of the European Union*, in "Official Journal of the European Communities 2000/C 364/01", 18 December 2000.

[13]European Union, *Consolidated version of the Treaty on the Functioning of the European Union*, in "Official Journal of the European Communities 2008/C 115/01, 13 December 2007.

[14]With the exception that such provisions are for example capable of hindering the exercise of fundamental freedoms of the EU; that is to say, due to the fact that they are only binding on the Member States when they act in the scope of Union law.

[15]C. Karakas, *Basic Income: Arguments, Evidence, Prospects*, European Parliamentary Research Service, 2016, p. 4.

[16]B. Hepple, *Achieving Social Rights through the Principle of Equality*, in "The Equal Rights Review", vol. 14, 2015, p. 16 ss.

[17]European Union, *Consolidated Version of the Treaty on the Functioning of the European Union*, cit.

[18]European Parliament, *Resolution on the Future of Social Security Systems and Pensions: Their Financing and the Trend Towards Individualisation*, in "Official Journal of the European Communities 2010/C 16 E/07, 20 November 2008.

[19]Council of Europe, *European Social Charter* (Revised), ETS 163, 3 May 1996.

[20]See https://www.coe.int/en/web/turin-european-social-charter.

[21]Wissenschaftliche Dienst des deutschen Bundestages, *Rechtliche Voraussetzungen für die Einführung eines bedingungslosen Grundeinkommen in Deutschland*, WD 3 - 3000 - 262/16, p. 3 ss., 2016.

[22]Most known Austrian case concerning this matter: The Austrian Constitutional Court (VfGH) repealed the provisions of the General Social Insurance Act (ASVG) on different retirement ages for men and women for violating the principle of equality (VfGH 06/12/1990, compendium of cases, VfSlg. 12.568); however, since women were entitled to a legitimate expectation of a certain (earlier) retirement age, the legislator had to implement temporary arrangements (until 2033).

[23]https://daliaresearch.com/wp-content/uploads/2016/11/2016-05-06_pressrel_UBI.pdf.

[24]See also L. Kalliomaa-Puha, A.-K. Tuovinen, O. Kangas, *The Basic Income Experiment in Finland*, in "Journal of Social Security Law", vol. 23, 2016, n. 2, p. 83 ss.

[25]For more information see P. Koistinen, J. Perkiö, *Good and Bad Times of Social Innovations: The Case of Universal*

Basic Income in Finland, in "Basic Income Studies", vol. 9, 2014, n. 1-2, p. 25-57.

[26] *Government Programme: Finland, the Land of Solutions*, Strategic Programme of Prime Minister Juha Sipilä's Government, 29 May 2015; the Government was nominated May 28 2015 by a coalition consisting of the Centre Party, the Finns Party and the National Coalition Party, led by Prime Minister Juha Sipilä's.

[27] The Finnish Social Insurance Institution (KELA) operates with its own finances and administration and according to legal terms and conditions defined by Finnish law. The institution's main tasks comprises providing information on benefits, researching on possible reforms of the social security system, planning and organization of benefit programs as well as payments to the recipients of all kind of benefits. For more information visit KELA's official website.

[28] See http://www.kela.fi/web/en/experimental-study-on-a-universal-basic-income.

[29] O. Kangas, *The Finnish Basic Income Experiment - "A Foolish and Outrageously Expensive Travesty"?*.

[30] L. Kalliomaa-Puha, A.-K. Tuovinen, O. Kangas, *op. cit.*, p. 79.

[31] O. Kangas, L. Kalliomaa-Puha, *Basic Income Experiment in Finland*, ESPN Flash Report 2016/13; O. Kangas, *Basic Income - Part of Tomorrow's Social Security?*, Event "Social Innovative Finland" organized by KELA, 12 January 2017.

[32] M. Turunen, *How the Basic Income Experiment Works in Practice*, Event "Social Innovative Finland", cit.

[33] O. Kangas, *Basic Income - Part of Tomorrow's Social Security?*, cit.

[34] For more information on their research and findings regarding all different models see KELA, *From Idea to Experiment: Report on Universal Basic Income Experiment in Finland*, 2016, an abridged version of the original report published in Finnish by O. Kangas, *Ideasta kokeiluun. Esiselvitys perustulokokeilun toteuttamisvaihtoehdoista*, 2016.

[35] A.B. Atkinson, *The Case for a Participation Income*, The Political Quarterly Publishing Co Ltd, 1996, p. 68.

[36] KELA, *From Idea to Experiment*, cit., p. 42 ss. and 53.

[37] *Ivi*, p. 54.

[38] KELA, *Preparations for the Basic Income Experiment Continue*.

[39] See http://www.kela.fi/web/en/basic-income-objectives-and-implementation.

[40] See http://www.kela.fi/web/en/-/study-population-for-basic-income-experiment-drawn-by-random-sample?inherit Redirect=true.

[41] See note 39.

[42] See http://www.kela.fi/web/en/basic-income-taxation; the fact that payments are tax-free was highly criticized for being too generous; however, due to budgetary and time reasons necessary, for more information see O. Kangas, *The Finnish Basic Income Experiment*, cit.

[43] Research team recommends expansion of basic income experiment in 2018.

[44] See https://www.theguardian.com/world/2018/apr/23/finland-to-end-basic-income-trial-after-two-years.

[45] O. Kangas, *The Finnish Basic Income Experiment*, cit.

[46] L. Kalliomaa-Puha, A.-K. Tuovinen, O. Kangas, *op. cit.*, p. 79.

[47] See http://www.kela.fi/web/en/basic-income-report-changes.

[48] See note 40.

[49] See http://www.kela.fi/web/en/basic-income-frequent ly-asked-questions.

[50] M. Turunen, *How the Basic Income Experiment Works in Practice*, cit.

[51] O. Kangas, *The Finnish Basic Income Experiment*, cit.

[52] OECD, *Economic Surveys: Finland*, OECD Publishing, February 2018, p. 45.

[53] See http://www.kela.fi/web/en/basic-income-how-other-social-security-benefits-affect.

[54] For more information on current Dutch trials see T. Verlaat, *Experimental Design and Implementation: Utrecht, Wageningen and Tilburg*.

[55] See note 40.

[56] O. Kangas, *The Finnish Basic Income Experiment*, cit.

[57] Also mentioned by O. Kangas, *Final Report for the Finnish Basic Income Experiment Recommends That the Experiment Be Expanded*.

[58] See note 43.

[59] See https://nordic.businessinsider.com/Finland-is-killing-its -world-famous-basic-income-experiment–/.

[60] See http://www.kela.fi/web/en/social-assistance-overview.

[61] J. Perkiö, *Universal Basic Income: A Search for Alternative Models*.

[62] O. Kangas, *Basic Income - Part of Tomorrow's Social Security?*, cit.

[63] Of course, this can only be visible and therefore examined if the experiment group will be expanded as suggested by the research group.

[64] C. Karakas, *op. cit.*, p. 4.

[65] OECD, *Policy Brief on the Future of Work. Automation and Independent Work in a Digital Economy*, OECD Publishing, 2016, p. 4; A. Berg, E.F. Buffie, L.-F. Zanna, *Robots, Growth, and Inequality*, in "IMF Finance & Development", 2016, p. 13; Committee on Legal Affairs of the European Parliament, *Report with Recommendations to the Commission on Civil Law Rules on Robotics* (2015/2103(INL)), 27 January 2017.

[66] Committee on Legal Affairs of the European Parliament, *Report with Recommendations to the Commission on Civil Law Rules on Robotics* cit., par. 59, lit. f).

[67] G. Prodhan, *Europe's Robots to Become 'Electronic Persons' under Draft Plan*; J. Valero, *Universal Basic Income Paid by a 'Robot Tax' Is a Bad Idea*.

[68] The first proposal of such a tax is dated 1989.

[69] A new proposal of this type of tax, which will be analyzed in paragraph 3.2.3., was suggested in the "Plan A für Österreich"; during the election campaign going on in France, also the left wing candidate Mr. Hamon has mentioned the introduction of such a tax as a response to the fourth revolution impact on the labor market.

[70] United Nations Conference on Trade And Development (UNCTAD), *Robots and Industrialization in Developing Countries*, 2016, n. 50; W.H. Weissman, *How Robots Will Kill Tax Administration and the Funding of Social Insurance*, Part II, in "Employee Benefit Plan Review", vol. 69, 2014, n. 1, p. 28.

[71] Committee on Legal Affairs of the European Parliament, *Draft Report with Recommendations to the Commission on Civil Law Rules on Robotics* (2015/2103(INL)), 31 May 2016.

[72] Committee on Legal Affairs of the European Parliament, *Report with Recommendations to the Commission on Civil Law Rules on Robotics*, cit., lit. k), p. 44, where it also suggests that there should be a debate on the possible introduction of a general basic income.

[73] Committee on Legal Affairs of the European Parliament, *Opinion of the Committee on Employment and Social Affairs for the Committee on Legal Affairs with Recommendations to the Commission on Civil Law Rules on Robotics* (2015/2103(INL)), 9 November 2016; in the first draft of the report of May the Committee on Legal Affair was even

providing more detailed recommendations such as considering "corporate reporting requirements on the extent and proportion of the contribution of robotics and AI to the economic results of a company for the purpose of taxation and social security contributions".

[74] European Parliament, *Resolution with Recommendations to the Commission on Civil Law Rules on Robotics*, 16 February 2017, point 43.

[75] *Ivi*, point 44.

[76] European Parliament, *Press Release on Robots and Artificial Intelligence: MEPs Call for EU-wide Liability Rules*, Plenary sessions, 16 February 2017.

[77] Such as the Austrian *Maschinensteuer*, which will be further explained, and the proposal for a "Robot-tax" of Mr. Hamon, the leftwing candidate for the French presidential election, who was chosen at a Socialist-led primary in January 2017.

[78] W.H. Weissman, *op. cit.*, p. 28

[79] More on the nature of these instruments depends from national laws. In general at European level: B. Spiegel, K. Daxobler, G. Strban, A.P. van der Mei, *Analytical Report 2014: The Relationship between Social Security Coordination and Taxation Law*, FreSsco, European Commission, April 2015, p. 10-11.

[80] The principle that tax liability should be based on the taxpayer's ability to pay is accepted in most countries as one of the bases of a socially just tax system. The ability-to-pay principle is, however, constitutionally binding in some countries. For example, under the Italian Constitution, "everyone shall contribute to public expenditure in proportion to his resources". The Italian Constitutional Court has held that ability to pay represents a specific application of the general principle of equality. The Spanish Constitution contains almost the same wording as the Italian. The German Constitutional Court held that the principle can be derived from Art. 3 (1) of the Constitution, which states that all persons shall be equal before the law; F. Vanistendael, *Legal Framework for Taxation*, in V.T. Thuronyi (ed.), "Tax Law Design and Drafting", International Monetary Fund, vol. 1, 1996.

[81] Problem also underlined by W.H. Weissman, *op. cit.*, p. 28.

[82] E.g. *Italian Income Tax Act* (Tuir), Art. 49 to 52; *Austrian Income Tax Act* (EStG) par. 25.

[83] Differently from the first draft, the final version of the Report on which the Plenary had recently voted states «creating a specific legal status for robots in the long run, so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons responsible for making good any damage they may cause, and possibly applying electronic personality to cases where robots make autonomous decisions or otherwise interact with third parties independently;» European Parliament, *Resolution with Recommendations to the Commission on Civil Law Rules on Robotics*, cit., point 59, lit. f).

[84] X. Oberson, *Taxing Robots? From the Emergence of an Electronic Ability to Pay to a Tax on Robots or the Use of Robots*, in "World Tax Journal", May 2017, p. 252.

[85] Rapporteur for the Report on Civil Law Rules on Robotics presented to the European Parliament plenary 15 February 2017; European Parliament, *Rise of the Robots: Mady Delvaux on Why Their Use Should Be Regulated*; The Rapporteur sustains that «when self-learning robots arise, different solutions will become necessary and we are asking the Commission to study options. One could be to give robots a limited "e-personality"».

[86] United Nations Conference on Trade And Development (UNCTAD), *op. cit.*

[87] W.H. Weissman, *op. cit.*, p. 28.

[88] WIFO (the Austrian economic research center) translated the word *Wertschöpfungsabgabe* as "value added tax", but we believe that using these terms could generate some confusion with the Value Added Tax (VAT), the indirect tax on consumption which in Austria goes under the name of *Umsatzsteuer*.

[89] *Wertschöpfungsabgabe: Druck bei Maschinensteuer*, in "Die Presse", 22 August 2016.

[90] A. Dallinger, *Wertschöpfungsabgabe*, ÖGB - Bundesfraktion, 21 February 1989.

[91] More information on the "Plan A" for Austria on http://www.meinplana.at.

[92] It was 4.5% until 31 December 2016, par. 41 Abs 5 FLAG.

[93] F. Schebeck, E. Walterskirchen, *Wertschöpfungsabgabe als Alternative zu lohnbezogenen Dienstgeberbeiträgen zum Familienlastenausgleichsfonds*, WIFO Monatsberichte (monthly reports), vol. 70, 1997, n. 9.

[94] M. Schratzenstaller, S. Bach, M. Arnold, A. Mattes, *Die Wertschöpfungsabgabe als alternatives Instrument zur Finanzierung der sozialen Sicherung aus Österreichischer Perspektive*, WIFO Monatsberichte (monthly reports), vol. 89, 2016, n. 10, p. 757.

[95] *Ivi*, p. 758.

[96] Translation by the authors of Art. 2 of the Italian Legislative Decree "Decreto Legislativo" n. 446, 15 December 1997.

[97] On the IRAP, general remarks can be found in F. Tesauro, *Istituzioni di diritto tributario*, Torino, Utet, vol. 2, 2016, Parte speciale, X ed., p. 346 ss.

[98] Italian Legislative Decree "Decreto Legislativo" n. 446, 15 December 1997.

[99] Critical opinions on IRAP: R. Baggio, *Profili di irrazionalità ed illegittimità costituzionale dell'imposta regionale sulle attività produttive*, in "Rivista di diritto tributario", 1997, n. 9, pt. I, p. 633; G. Falsitta, *Aspetti e problemi dell'Irap*, in "Rivista di diritto tributario", 1997, n. 6, pt. I, p. 500; L. Ferlazzo Natoli, A. Colli Vignarelli, *Il meccanismo impositivo dell'Irap: dubbi di costituzionalità*, in "Bollettino tributario", 1998, n. 8, p. 649; More *in favor*: F. Gallo, *La tassazione dei redditi d'impresa, i difetti e le proposte di modifica*, in "Rassegna tributaria", 1997, n. 1, p. 121; A. Fedele, *Prime osservazioni in tema di Irap*, in "Rivista di diritto tributario", 1998, n. 5, pt. I, pp. 453-473.

[100] Italian Constitutional Court decision n. 156, 21 May 2001. Among many, more on this decision and the relationship between IRAP and the ability to pay principle in F. Batistoni Ferrara, *L'Irap è un'imposta incostituzionale?*, in "Rivista di diritto tributario", 2000, n. 2, pp. 95-102, in particular pp. 96, 97; G. Falsitta, *Il principio della capacità contributiva nel suo svolgimento storico fino all'Assemblea Costituente*, in "Rivista di diritto tributario", 2013, n. 9, pp. 761-849; R. Schiavolin, *Prime osservazioni sull'affermata legittimità costituzionale dell'imposta regionale sulle attività produttive*, in "Giurisprudenza italiana", 2001, n. 10, pp. 1979-1983.

[101] Italian Constitutional Court decision n. 156, 21 May 2001; F. Tesauro, *op. cit.*, p. 352.

[102] ECJ judgment of 3 October 2006 in *Banca Popolare di Cremona Soc. Coop.a.r.l. v. Agenzia Entrate Ufficio Cremona*, Case C-475/03, [2006] ECR I-9373. R. Schiavolin, *L'Irap non è un'imposta "sulla cifra d'affari" vietata dalla VI Direttiva Iva*, in "Rassegna tributaria", 2007, n. 1, p. 315; critical on this decision A. Contrino, *The ECJ's Remarkable Decision on IRAP*, in "International VAT Monitor", 2007, n. 6, p. 447 ss.

[103] Green taxes instead of a tax on the created value are supported by the previous chief of the WIFO, Karl Aiginger; E. Frey, *Wertschöpfungsabgabe: Abtauschen statt blockieren*, in "Der Standard", 21 August 2016.

[104]OECD, *Taxation, Innovation and the Environment*, OECD Publishing, 2010; P. Ekins, S. Speck, *Environmental Tax Reform (ETR): A Policy for Green Growth*, Oxford, Oxford University Press, 2011; J.E. Milne, M.S. Andersen (eds.), *Handbook of Research on Environmental Taxation*, Cheltenham, Edward Elgar, 2012; L. Castellucci, G. Piga, A. Markandya, *Environmental Taxes and Fiscal Reform*, Basingstoke, Palgrave Macmillan, 2012.

[105]K. Kosonen, G.J.A. Nicodème, *The Role of Fiscal Instruments in Environmental Policy*, European Commission Taxation paper, 2009, p. 8.

[106]M. Rodi, H. Ashiabor, *Legal Authority to Enact Environmental Taxes*, in J.E. Milne, M.S. Andersen (eds.), "op. cit.", p. 76 ss.

[107]A. Cuthbertson, *Geothermal Gold: Why Bitcoin Mines Are Moving to Iceland*, in "International Business Times", 7 October 2014.

[108]This was also suggested by I. Sohn, *Taxing Consumption Would Be More Efficient*, in "Financial Times", 7 January 2016.

[109]Harmful Tax Competition is a term which started to be used from the publication by the OECD, in 1998, of a paper defining it as the practice of governments «to adopt harmful preferential tax regimes to attract mobile activities»; OECD, *Harmful Tax Competition An Emerging Global Issue*, OECD Publishing, 1998.

[110]This might be reachable at European level even if on tax matters unanimous vote is required (Art. 114 TFEU).

[111]X. Oberson, *op. cit.*, p. 252.

[112]On the same opinion also K. De Leus, *Investment in Training Is Better Than a Robot Tax*, in "Financial Times", 10 March 2017 and L. Summers, *Robots Are Walth Creators and Taxing Them Is Illogical*, in "Financial Times", 5 March 2017.

* * *

Intelligenza artificiale e mercato del lavoro. Una analisi critica delle possibili soluzioni nella prospettiva del diritti tributario e della previdenza sociale

Riassunto: Basandosi su recenti studi economici, il presente contributo prende in considerazione due possibili scenari legati all'avvento dell'intelligenza artificiale e al suo impatto sul mercato del lavoro: mentre il primo (scenario A) prevede un possibile stato di disoccupazione di massa, il secondo (scenario B) evidenzia invece una situazione di carenza di profili adeguati, richiesti dalle nuove tipologie di lavoro venutesi a creare grazie allo sviluppo tecnologico. Attraverso la disamina di questo duplice panorama, si procede dunque all'analisi dei rimedi oggetto di dibattito a livello mondiale e concernenti politiche di welfare e tributarie che gli Stati potrebbero adottare. La prima parte del contributo si concentra pertanto sulla possibilità di introdurre un reddito minimo garantito per i cittadini (UBI – unconditional basic income) ed esamina il recente esempio finlandese. La seconda parte è invece dedicata alle politiche tributarie ed, in particolare, alle problematiche legate all'introduzione di una cd. robot tax.

Parole chiave: Intelligenza artificiale – Automazione – Lavoro – UBI – Unconditional Basic Income – Robot tax