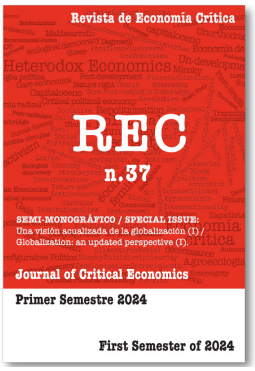
ON THE EFFECTS AND CHALLENGES OF AUTOMATION AND DIGITIZATION. PART II, SOME CONSEQUENCES OF DIGITIZATION AND THE PROBLEMS THAT COME WITH. / EFECTOS Y DESAFÍOS DE LA AUTOMATIZACIÓN Y LA DIGITALIZACIÓN. PARTE II, CONSECUENCIAS Y PROBLEMAS DERIVADOS DE LA DIGITALIZACIÓN.[1]



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Abstract

In the first part of this contribution, an update of the works that have studied the effects that automation and digitization are having on employment has been offered. This second part is intended to draw attention to certain problematic consequences, in the present and in the future, to which digitization gives rise, in particular Artificial Intelligence, in a variety of fields: the effects on productivity; on a growing inequality; the emergence of digital divides; the environmental costs of automation and digitalization; the impact on tax systems; and the dangers and risks, both in the private and the public sector, of the huge amount of personal data collected and its use, filling a gap in the literature by offering a broader and more integrated perspective on the subject.

Keywords: *Digital revolution; Automation; Industrial revolution; Industry 4.0; Labour, Employment and Work organization.*

JEL Classification*: O33 · O25 · L50 · J21 · J30*

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Resumen

En la primera parte de esta contribución se ha ofrecido una actualización de los trabajos que han estudiado los efectos que está teniendo la automatización y la digitalización sobre el empleo. En esta segunda parte se pretende llamar la atención sobre ciertas consecuencias problemáticas, en el presente y en el futuro, a las que da lugar la digitalización, en particular la Inteligencia Artificial, en una variedad de campos: los efectos sobre la productividad; una desigualdad creciente; la aparición de brechas digitales; los costos ambientales de la automatización y la digitalización; el impacto en los sistemas tributarios; y los peligros y riesgos, tanto en el sector privado como en el público, de la enorme cantidad de datos personales recopilados y su uso, llenando un vacío en la literatura al ofrecer una perspectiva más amplia e integrada sobre el tema.

Palabras clave: *Digitalización; Automatización; Revolución industrial; Industria 4.0; Trabajo, empleo y organización del trabajo.*

JEL Clasificación: *O33 · O25 · L50 · J21 · J30*

INTRODUCTION

In the first part of this work, we have presented an update of the papers that have deal with the effects of automation and digitization on employment and wages, concluding that is not easy to reach a simple and straightforward explanation of such effects.

In this second part we consider necessary to draw attention to at least **seven problematic consequences**, in the present and in the future that automation and digitization is giving rise to, and that go beyond the effects on work and employment, giving us clues as to where we should go. It is not intended to make an exhaustive analysis of the problems that digitalization and automation are causing, surely there will be things that will have been left. As far as they are well known and sufficiently publicized, there is also no reference to the positive effects they bring to us, namely higher productivity, better product quality and more consumption, improving environmental management[2].

THE EFFECTS ON WORKING CONDITIONS AND PRODUCTIVITY

First, digitization will have direct effects on working conditions and productivity**,** even there is not yet enough information on this. Workplace digitization facilitates the emergence of what has been named as "data-driven management"[3], which "may affect work organization, workplace practices and well-being, establishment performance and aspects of job quality, such as occupational health and safety" (Urzì, Curtarelli and Baiocco, 2022; 9). The adoption and use of digitization technologies in companies is mostly driven by the need to increase productivity (and profitability) and reduce costs[4]. Data analytics, a technology enabling data-driven management, is no exception to this. However, the consequence of its use for the management of workers is associated with an increase in reported psychosocial risks in the workplace, in particular time pressure and long or irregular working hours, especially when it comes to technologies

[2] Dauvergne (2022) refers to the *greenwash* of transnational companies, with the aim of enhance the value of the company's brand, projecting an image of corporate social responsibility and environmental sustainability.
[3] The employers' ability to back-up their decisions with the information provided by the data collection, storage, and processing by means of sensors or digital devices at the workplace.
[4] The survey conducted by the OECD (Lane, Williams and Broecke, 2023) reports that employers say that improving worker performance and reduced staff costs are the main motivation for the adoption of AI. 57% of employers in the financial sector and 63% in the manufacturing sector reported that AI have a positive effect on worker productivity.

monitoring performance (Urzì, Curtarelli and Baiocco, 2022; 42), and this affects both platform workers and workers in traditional workplaces[5].

In OCDE surveys (Green at alia, 2023), just over 50% workers report a positive impact of AI on performance and working conditions, being those that reported the greatest positive effect those who develop or maintain AI, and those who manage workers who are using AI. This is because AI automate tedious and repetitive tasks and is associated with grater autonomy over workers' tasks. The OECD surveys find that mental health and physical health improved after the introduction of AI, although the benefits are enjoyed mainly for those workers with tertiary education. These findings contrast with the results of a representative survey of German companies, showing that digitalization causes a significant proportion of individual psychological stress: nearly half of all employees (46%) associate digitalization with an increasing workload, while only 9% experience a reduction of their workload (Warning, Weber and Püffel, 2022; 2).

AI's very specific characteristics, such as information asymmetries and its own complexity, put additional pressure on labour relations. If the number of workers who are members of trade unions and covered by collective bargaining has fallen dramatically in almost all countries, the introduction of AI may exacerbate the problem of the low representativeness of social partners, even more so if there is a lack of experience in this technology. Still, when employers consult workers or their representatives, they are more likely to see AI as improving their performance and working conditions (Cazes, 2023).

At firm level, when asked directly, employers which introduced AI tools do report that increases worker productivity, however, the evidence for a positive casual relationship between AI and productivity is so far tenuous (Green *et al.*, 2023). Further, from a macroeconomic perspective, just as it happened in the fourth long wave of capitalism, it does not seem that substantial gains are being made in productivity (the so-called Solow paradox formulated in 1987)[6], although Albarracin (2022) qualifies that productivity increased between 1990 and 2004 and it is from then on when a tendency to stagnation is observed[7]. What digitization is doing is increasing the fluidity of markets and lowering barriers to entry, as well as increasing dependence on global digital platforms[8]. To this regard, it is necessary to decide in what type of AI is being invested because, as Acemoglu and Restrepo (2019; 3) point out, in an era of rapid automation, if new technologies do not increase productivity sufficiently, the relative position of work will deteriorate, and workers will be particularly affected. So, if not enough attention is paid to AI creating new and greater demand for work, rather than simply replacing it, we would be facing a socially and economically wrong type of AI and would have to be stopped before it was too late[9].

Besides, the fact that digital platforms rely fundamentally on network externalities on both sides of the market, leading to monopolistic structures with various "blocking" strategies, is giving rise to a new form of digital monopoly capitalism, in which the so-called "winner takes it all" dynamic becomes dominant, as

[5] For a review of the positives and risks of task reorganization because of AI adoption in workplaces, see Lane and Saint-Martin (2021; 43-51). For a perspective on the main ethical risks of using AI in the workplace, see Salvi, Wyckoff and Vourc'h (2022).
[6] Solow's phrase is, "you can see the computer age except in productivity statistics". It appears in a literature review published in *the New York Times Book Review* on July 12, 1987. An explanation of this paradox can be found in Arntz, Gregory and Zierahn (2019).
[7] An opposite opinion is that of Wren (2022), who argues that digitalization has its most revolutionary impact in facilitating productivity increases in trade and services. Dervis and Qureshi (2016) analyzed productivity statistics for the United States and although their figures only go up to 2014, they confirm that there has indeed been a slowdown in productivity growth and that it is not because statistics are failing to capture productivity gains from higher quality ICT goods and services. The OECD data, which reach until 2021, confirm the reduction in growth since 2004, with two rebounds in 2010 and 2020, although with the well-known divergence between member countries (OECD Compendium of Productivity Indicators 2023, OECD Publishing, Paris, https://doi.org/10.1787/74623e5b-en).
[8] This evolution is related to the cycle of technological innovations which, as is known, affects product innovations and process innovations differently, considering that it is in process innovation where automation occurs (Utterback, 2001). Although it seems that at the company level there is a positive relationship between digitization and increased productivity (Gal *et al.*, 2020)
[9] It has been argued, with data from Italy, that the introduction of artificial intelligence in companies, apart from the possible productivity gains it would lead to, it can be a particularly useful instrument in reducing infections in the case of pandemics such as COVID-19 (Carbonero y Scicchitano, 2021).

market concentration allows winners to extract profits globally and for a much longer period of time (Soete, 2018; 38). Also, it is argued that the platforms are highly inefficient in terms of productivity, since they are allowed to transfer the business risks, which the employer should assume, to the workers[10].

THE CHALLENGES THAT ARTIFICIAL INTELLIGENCE POSES IN MANY FIELDS

Referring to Artificial Intelligence (AI) as one of the main components of the digitization process of our economies and societies, nowadays AI poses numerous challenges due to the changes it introduces in many fields[11]. While its use in the field of production and public management has led to substantial advances, with noteworthy applications, for instance in credit scoring and lending, insurance, legal assistance, medical diagnosis, and sport activities, it should not be forgotten that the use of algorithms by AI can discriminate against certain groups or individuals, including women, for example, in the criminal justice system and in selection processes, a crucial aspect on which we will return later. The bias comes from both the data that trains algorithms and the people who make them (Craglia, 2018; 58). The implications regarding the invasion of privacy are so great, the so-called "surveillance capitalism" that Shoshana Zuboff (2020) tells us about, either as "free market" capitalism or as "state" capitalism, which is claimed the individual right not to be measured, analyzed, or trained by means of AI. Besides that, digital platforms, that collect and effectively process huge amounts of data, "might be able to predict consumer behavior and biases beyond what the consumers themselves can know or understand" and, as a consequence of a behavioural manipulation, "the individual will engage in an impulse purchase or make other choices with apparent short-term benefits and long-term costs" (Acemoglu, 2021; 14-15).

There are also macroeconomic effects because, on the one hand, it can give a new impetus to globalization, yet on the other hand it can lead to a repatriation of jobs which previously had been reallocated to low-wage countries. Although it has not been precisely digitization that has highlighted the serious problem of the reallocation (offshoring) of industries in the first world, but the arrival of a virus, SARS-Cov-2, with which we discover that the manufacture of the most essential elements (respirators, protective equipment, masks, etc.) has been practically all located in Asia and there was not and there is not sufficient production (not even of quality) to meet the urgent and simultaneous demand of the countries of that first world. This has led to rethinking the supposed advantages of reallocation, as part of a broader debate on strategic autonomy and countries' sovereignty.

Regarding the market structure, as has been documented before, "the diffusion of AI technologies is actually reinforcing the overall trend towards market concentration characterizing the ICT techno-economic paradigm" (Fanti, Guarascio and Moggi, 2022; s4), with a few Big-Tech companies consolidating their dominant positions, through the acquisition of the more promising start ups and the owning of most patents. Anyway, this market power is aimed at promoting innovations whose objective is the extraction of our data, decode our emotions and thoughts, and better manipulate the consumer/user behaviour. Firms are increasingly delegating decision on prices to Machine Learning (ML) algorithms, which help a

[10] It is striking, as Piasna (2020) points out, that the magnitude of employment on platforms is not known with certainty, considering that all transactions mediated by online platforms are recorded digitally. A review of the available estimates can be found in Drahokoupil and Piasna (2022).

[11] The monographic issue of the *Cambridge Journal of Regions, Economy and Society*, Volume 13, Issue 1, March 2020, in particular the introductory essay by Clifton, Glasmeier and Gray, (2020), is recommended. A documented review of the history of AI and an account of its impact on business model organization and work, from an evolutionary perspective, in Fanti, Guarascio and Moggi (2022). Although it is beyond the scope of this article, I do not want to fail to mention the challenge that the launch of ChatGPT-3.5 in November 2022, and GPT-4 in March 2023, both of OpenAI, represents for the way in which scientists work, for the educational system, in short, for science and for society. ChatGPT, the first version of which was launched in 2018, is a chatbot that uses Artificial Intelligence with the technology of Large Language Model (LLM), a new generation of IA known as *generative*, that unlike the previous one, which recognizes patterns and provides a result, it can generate text, images, video, or music from scratch. For an overview on how it works generative AI see Hatzius *et al.* (2023), and for more details on how it has been constructed GPT see Gmyrek *et al.* (2023). A summary of the implications of this potentially disruptive technology and some questions for debate can be found in van Dis *et al.* (2023).

finer targeting and segmentation of the market, enlarging the scope for price discrimination. "Algorithmic pricing may facilitate collusion via two main channels. First, ML algorithms learn to react to rivals 'prices much more quickly that human beings (…) Second, ML-based algorithms actively learn the optimal strategy purely by trial and error, by intentionally experimenting sub-optimal prices", and leaving no clear trace of concerted action. (Abrardi *et al.*, 2023; 984).

Some point out that, to the extent that AI becomes part of the general conditions of capitalist production, its development would result in reaching a whole new level of automation, giving capital unprecedented independence from labor (Dyer-Witheford, Mikkola and Steinhoff, 2019; 32). In any case, the threat to economic (and human) reproduction implicit in the revolution that AI can bring, arises on a systemic level, and therefore must be faced at that level.

An unsuspected aspect of Artificial Intelligence is that for algorithms to work they need extensive and intensive training, and that training depends on hundreds of unskilled workers, "worker bees" without labour rights, hired by companies in Kenya, Uganda, India, Venezuela, even in the United States. These workers charge less than two dollars an hour to, among other things, search, and label by hand those contents that they do not want to repeat, such as sexual abuse, bestiality, murders, suicides, torture, but also to recognize a chair or to translate audio fragments difficult for automatic translators, thus giving the paradox that artificial intelligence increasingly consumes more humans[12].

A GROWING INEQUALITY

The new technological revolution could cause a growing inequality, as there is an increase of the share of national income attributed to capital at the expense of labour, to the extent that income from digital innovation is being appropriated by the highest income groups, the 1 and 10 per 100: shareholders, investors, senior executives, and key employees of the winning companies (who usually own capital and hold managerial positions and managerial positions in the same). What is worse, as Soete (2018; 42) warns among many others, is that we are seeing that this concentration of wealth and economic power associated with digitization is leading to a similar concentration of political power, which ultimately undermines democracy. There are even those who warn of the danger of the disappearance of the "middle class" – whose quantitative and qualitative importance has not ceased to diminish in the last 30 years (OCDE, 2019) – and the emergence of a "feudal" capitalism (Johannessen, 2018).

In addition, it may be that, as Varoufakis argues[13], a new ruling class, or a new fraction of it, is emerging, the cloud entrepreneurs (*cloudalists*), who have two new powers that set them apart from the traditional service sector. First, *cloudalists* can extract huge rents from manufacturers whose stuff they persuade us to buy, because the same command capital that makes us want that stuff is the foundation of platforms where those purchases take place. Second, the same algorithms that guide our purchases also have the capacity surreptitiously to put consumers at their service to sell them more and thus to produce new command capital for the *cloudalists*.

The introduction of digital technologies "does not seem to indicate to us is a change in the essence of the prevailing socio-economic model. On the contrary, everything indicates, if politics does not prevent it, an intensification of the processes that generate socio-economic inequalities both globally and in each of the

[12] Besides, there are crowdsourcing Internet service providers, performed on-demand by human workers, that support, maintain and train machine learning algorithms by empowering AI systems. These workers, although they are geographically dispersed and pervasively monitored, do not necessarily have to be low-skilled or low-paid. The paradigmatic example is Amazon Mechanical Turk, launched in 2005, yet there are many other providers that offer a wide variety of services https://www.quora.com/Are-there-any-similar-services-to-Amazon-Mechanical-Turk.
[13] Yanis Varoufakis, "Cloudalists: Our New Cloud-based Ruling Class". 12-04-2022. https://www.yanisvaroufakis.eu/2022/04/12/cloudalists-our-new-cloud-based-ruling-class-project-syndicate-op-ed/ Translated into Without Permission, 15/04/2022: "The new ruling class is being constituted in the cloud".

States" (Linares y López, 2016; 232-233). This is what one of the main spokespeople of the so-called fourth industrial revolution points out: "inequality represents the greatest social concern associated with the Fourth Industrial Revolution" (Schwab, 2016). Although Schwab believes that is technology, not the political decisions and economic policies that follow, one of the main reasons why rents have stagnated or even fallen for most of the population in high-income countries, due to the polarization in jobs according to educational skills. An assessment that is at best partially correct, at least as regards the functional distribution of income in the more developed countries, since the continued decline in the share of wages in value added and the increase in inequality are not so much due to technological progress and, in particular, automation, but rather to the effects of globalization (the reallocation or industry offshoring), *financialization* and the loss of bargaining power of workers through trade unions, that is, factors related to the institutional and social structure and political decisions that have led to weaker labour standards, new employer-imposed contract terms and shifts in corporate structures[14].

What is undeniable, as Recio (2018; 54) points out, is that "digitization constitutes a set of technologies that allow strengthening the power of capital in the three areas of conflict: that of the distribution of income (facilitates access to cheaper labor force), that of control and that of flexibility (since it also facilitates an organization of activity in real time)". In fact, digitization is a way of optimizing production processes that has a clear pro-capital bias.

THE EMERGENCE OF *DIGITAL DIVIDES*

In addition to its effects on inequality, economic and political, digitization has led to the emergence of *digital divides*, understood as inequality in access to new information and communication technologies and inequality in the knowledge and skills necessary for their use, to the extent that there is a division between people who have access to and use digital media, and those who have access but does not have the skills to use it properly (van Dijk, 2020). While it is not a simple division between two social categories, it would be more appropriate if perhaps a division into three steps: at one end an information elite and at the other the digital illiterate or the totally excluded, and in the middle would be most of the population, which has access in one way or another and uses digital technology to a certain extent[15]. Here again arises the debate of whether digitization and the technologies that accompany it generate inequality by themselves or are the already existing inequalities that are reflected in the processes of digitization, and more than a technical issue is a social problem. Because if it is considered that the second is the right thing to do, "policies to reduce digital gaps should not be limited to the field of access and use of digital technologies but should also act in other broader areas such as the right to decent housing or education" (Aragon, 2021; 196), as well as take into account the size of companies, given the disadvantages of micro and small enterprises[16].

If since the beginning of the century the digital divide began to be analyzed in terms of access to the Internet, those who had access compared to those who did not, the first level of digital divide. Then a second level of that gap began to be studied, by including other dimensions such as the quality of access, the type of use, the digital skills and abilities of people, their emotions and experiences or their own motivation and attitudes towards technologies. The most recent research (Ragnedda, 2017; van Dijk, 2020) refers to a third digital divide, related to the use that subjects make of of technology, understanding that there is no clear distinction between *the* online and offline areas of activity, since, to a certain extent, all online activity occurs within a certain offline and, on the other hand, many social practices and everyday activities depend

[14] Analysing what happened in the United States, Mishel (2022) shows that automation, given its slow pace in recent years, is unlikely to have been a major factor driving wage stagnation or wage inequality in the last two decades.
[15] If any delineation is required, a tripartite society might be a better definition tan a two-tiered one. At one extreme we perceive an information elite and at the other the digitally illiterate or the fully excluded. In between are most of the population, having access in one way or another and using digital technology to a certain extent.
[16] For an overview of the digital divides in Spain can be seen Consejo Económico y Social (2021; Chapter 3).

on the use of technological devices connected to the network. Digital divides can come from supply, that is, from the existence of infrastructures that allow access in all territories, with quality and at an affordable price. Though in the most "developed" countries, digital divides are mainly of use or demand, as they are related to educational level, age, income level, migrant status, ethnicity, sex or gender, health status (in particular people with disabilities), rural areas, among the most relevant factors. The pandemic caused by COVID-19 has highlighted the seriousness of digital divides, particularly in the fields of education and health, as well as in migrants and those in precarious jobs or in the informal economy, but also in access to public services and benefits, increasing in all cases previous inequalities[17].

A recent research survey conducted in Spain (Fundació Ferrer i Guardia, 2022) addresses digital divides, distinguishing between the access gap, the use gap, and the achievement gap. *The access gap* increases with age (24.3% of people over 65 do not access), income level (19.9% of people with incomes below 1,100 euros per month); access to a computer also decreases with age (46% of those over 65 do not have) and income (only 50% in households with incomes of less than 1,110 euros per month), so that 33.52% of respondents belong to a low digital inclusion profile (characterized by a greater presence of women, 63%; over 65 years, 59.5%; retirees, 61%; with incomes of less than €1,100/month, 32%; and with primary education, 35%). *The use gap* increases with sex, age and decreases with the level of education, with 8.5% of respondents who have never used the Internet, while 85.1% use it daily, though there are 88% of respondents without studies who have never or almost never done administrative procedures online. And *the achievement gap*, as digital skills decrease with age and increase with the level of education, with the level of income and with having a work activity, with 18.1% of respondents who have felt digitally excluded frequently. The achievement gap is very high with regard to relations with the public administration in Spain, since the language used with citizens is not clear in 78% of the administrative texts analysed, 85% of the usual procedures are difficult to understand, so they do not respond to the needs demanded by people and in some cases affect policies of great importance, such as the application for the Minimum Vital Income or the registration of a birth. A total of 83% of respondents left without completing any procedure due to the impossibility of understanding it, being the main difficulty for 49% not being able to contact someone to resolve doubts [18].

A digital divide little or nothing mentioned is the one that occurs in the field of jobs, related to the comparison between the use of digital technologies at work and the use in the private life of workers, which requires analyzing the profile of those who do not use them in their jobs. Though, that is not the same as analyzing the digitalization of work processes and specific digital skills necessary in a flexible Labour market, to which all the attention has been devoted. This gap has been analyzed for Spain by Calderón *et al.* (2020) through a survey, conducted in 2016, to which 2,800 people responded, of which 34.4 per 100 used the Internet at work[19]. The higher the level of education, the greater the multiple use of mobile devices (telephones) and landlines (computers at work), as well as this multiple use occurs more among people whose economic situation is good or very good, among men more than among women and between 34 and 55 years, which provides an idea of how digital divides are presented in jobs, giving a more complex vision than the polarization hypothesis suggests.

Related to the *polarization* effect and the voice of workers (Özkiziltan and Hassel, 2020; 20), to what extent are the presence of trade unions and collective bargaining able to counteract the effects of technological

[17] Although focused on the case of the United States, an overview of the effects of COVI D-19 on digital divides can be seen in Lai and Widmar (2021). With a broader perspective, the report of the Secretary-General of the United Nations (United Nations, 2020) can also be seen. The survey of Fundació Ferrer I Guardia (2022) reports also on the impact of COVID-19 on the Spanish population: only 25% of respondents say their digital skills have improved after the pandemic.
[18] Clara Rebollo: "El 'vía crucis' de hacer trámites digitales con la Administración" (The "via crucis" of doing digital procedures with the Public Administration). El País. January 24, 2023.
[19] It is very disturbing that the report of the Spanish Consejo Económico y Social (2021) does not devote a single word to the digital divide in jobs.

change on routine tasks? Parolin's research (2019), referring to 16 OECD countries shows that "while bargaining coverage is more significant for the wage growth of high routine occupations relative to less routine ones, high routine occupations lose their bargaining coverage at a more rapid speed than non-routine ones when collective bargaining coverage at the national level shrinks"[20].

THE ENVIRONMENTAL COSTS OF DIGITIZATION AND AUTOMATION

Do not forget the environmental costs that are already occurring because of digitization and automation. As Mahnkopf (2019; 13) points out, when calculating the potential savings that digitization will bring, the electrical energy required by the multiple "smart" products used in production is usually not considered, nor the energy that is required for the disposal or recycling of old or defective products. Global data centers also consume a lot of energy (and water[21]) and if you add the energy used in data transmission, it is estimated that it represents between 3 and 4 per 100 of the total energy consumed in the European Union in 2016 and, if no action is taken, it is expected to double every four years[22]. According to *statista.com*, the annual electricity consumption of all the world's data centers in 2019 was 205 terawatt-hours (TWh) – of which more than half is due to the use of cryptocurrencies – higher than the consumption of many countries: Germany's was 524 TWh and Norway's was 124 TWh[23]. A note of the Parliamentary Office of Science and Technology of the UK (UK Parliament, 2022) reports that data centers, communication networks and user devices accounted for an estimated 4-6% of global electricity use in 2020, 5-8% including televisions, and the forecast is that ICT energy use is likely to increase over the next 5-10 years.

However, it is not only the insatiable need for energy, but as digital infrastructure also requires an immense number of metals, many of them linked to geopolitical conflicts and civil wars. And there is the growing amount of electronic waste, with metals having a low recycling rate, waste that is sent to poor countries and to landfills in poor neighborhoods or towns, what Dauvergne (2022; 709) calls "the shadows of consumption". Today it does not seem that technological development is achieving the decoupling between the process of economic accumulation and its impact on nature, both in terms of emissions (decarbonization) and in terms of the use of natural resources (dematerialization) (Bellver, 2018; 75), probably because it is not a priority.

Working on the network does not mean that it does not produce pollution, because behind it there is a gigantic network of servers and communications using increasing resources to meet the growing demand for speed and capacity. The question is whether the use of information and communication technologies (ICTs) reduces energy consumption or not. And the answer given by Lange, Phil and Santarius (2020) is no, since the effects of an increase in energy consumption (the direct effect of the change in energy consumption in the ICT sector and the impact of digitalization on economic growth), are greater than the effects that reduce consumption (greater energy efficiency and the sectoral change of the economy), so the authors conclude that digitization thereby destroys its own potentials.

[20] Özkiziltan and Hassel (2020) offer an overview of the role of trade unions in the introduction and use of technological innovation in Germany, pointing out the inconsistencies in the available research, all of which are quantitative, so they call for research that also pays attention to case studies and qualitative data.
[21] Manuel G. Pascual: "El hipercentro de datos de Meta en Talavera consumirá más de 600 millones de litros de agua potable en una zona en peligro de sequía" (The Meta data hypercenter in Talavera will consume more than 600 million liters of drinking water in an area in danger of drought). El País, 9 May 2023.
[22] Mohamed Cheriet, professor of Systems Engineering at the School of Technology at the University of Quebec (Canada), estimates that the use of information technologies is "responsible for 4% of the greenhouse gases produced by human activity, slightly higher than the global aerospace industry". Quoted by Raúl Limón in the newspaper *El País*, April 1, 2022. "Your day-to-day internet pollutes a year as much as a car trip of more than 1,000 kilometers".
[23] https://www.statista.com/chart/18632/estimated-annual-electricity-consumption-of-bitcoin/ May 6, 2021. See also, for similar figures, Chiarella *et al.* (2022).

THE IMPACT OF DIGITIZATION ON TAX SYSTEMS

It must be considered indeed the impact of digitization on tax systems. An impact that adds to that already produced by globalization, which has greatly hindered the effective taxation of international and transnational companies, not only because of the fragmentation of their activity among many countries due to global value chains, but also because of the tax planning of companies favored by tax havens of all kinds, some of them result from downward tax competition even in areas such as the European Union (the scandalous cases of Ireland, Luxembourg and the Netherlands). Tørsløv, Wier and Zucman (2020) have calculated the amount of profits that have been derived to tax havens, 40 per 100 of multinational companies, and the loss that this implies for countries with high taxation, which in the case of countries that are not tax havens in the European Union supposes a 20 per 100 reductions in the profits they tax.

According to Gelepithis (2022; 356), digital business has three characteristics that have implications for tax policy: "(1) the creation of value using platform-enabled 'gig' employment; (2) the creation of value based on intangible assets like user-generated data; and (3) the creation of value from cross-national electronic commerce". The new digital business models challenge the current design of national and international rules of taxation, namely the direct taxes on Labour, the indirect taxes on consumption and the taxes on corporations.

Regarding the direct taxes on labour, to the extent that the jobs that are created by digitization, if in the end net employment is created, those jobs may be increasingly precarious, as in the case of digital platforms, so that less taxes on work will also be collected. Online platforms rely on self-employed workers o independent contractors, which in many countries are taxed more lightly than dependent labour. Besides, employers usually make lower social security contributions for self-employed workers, if they even make any contributions at all, and tax deductions lower the personal income tax liability of unincorporated self-employed workers. Though digitalization does not seem to have increase the rate of self-employment in OCDE countries, "gig" employment has potentially significant effects in terms of social security and income tax revenues. As there are significant opposition to even out the differences in the tax treatment of dependent labour and self-employed, the solution, as has been done in Spain, is to consider by law that platform employees are not self-employed, but dependent workers.

As regards Value Add Tax and Corporate Tax, the problem is that the traditional framework of international taxation does not fit the implementation of the activities of the digital economy, for at least three reasons. First, digital activities do not require a physical presence in a given country, giving rise to problems of taxation, identification of taxable people and control of transactions. Second, problems also arise in quantifying the tax base, due to the importance of intangibles and operations conducted remotely (cloud computing). And third, problems for the administration and payment of taxes, due to the possibility that the bidders or intermediaries – platforms – are not resident for tax purposes in the country of consumption or the payment methods do not have formal financial traceability. There are international organizations dealing with these issues, such as the OECD, the International Monetary Fund, and the European Commission, even though their proposals have come to practically nothing, in the latter case in the face of the logical opposition, among other member states, of tax havens such as Ireland, so national initiatives have emerged to tax digital services, in particular advertising. So far, the OECD's attempts to force large digital companies to pay taxes in the countries where they operate and their customers, within the framework of the BEPS (Base Erosion and Profit Shifting) project, have not been successful[24]. In March 2018, the European Commission published a proposal for a directive on a tax on digital services at EU level,

[24] The OECD has calculated the impact of a reform of international tax rules, based on two pillars, to address the challenges arising from digitization, the detail of which is not taken into here and whose effects would be a small increase in the investment costs of multinational companies, which would be partially or fully offset by a supposed greater efficiency in the overall allocation of capital, by increasing the importance of non-tax factors in investment decisions (OECD, 2020).

but due to the frontal opposition of Ireland and the Nordic countries at the Ecofin meeting in May 2019, the project for implementation is currently stalled and will most likely not occur in the short term, so some Member States are unilaterally approving their own taxes, including Spain.

As the report of the Spanish Economic and Social Council (Consejo Económico y Social, 2021) points out, it is difficult to prevent companies from establishing themselves in the most favorable countries in terms of taxation, so that, as has been proven with the pandemic, the transfer of economic activity to networks has improved the performance of new technology companies, but without a significant increase in total tax revenues[25].

A different yet related tax issue is the proposal to levy a tax on digital advertising. The aim of the proposal is to contribute to change the current business model of the Big Tech which, as it is well known, is based on collecting huge amounts of data from users and monetizing them with their sale to advertisers, who are willing to pay for inferences and prediction about people behaviour, tastes, and everything else, as accurate as possible. This model can be considered, without any doubt, as destructive. The tax could be a way to reduce the temptation "to maximize user engagement through emotional manipulation; and, if coupled with limits on data collection, it would provide incentives to develop alternative approaches, such as subscription-based models"[26].

Undoubtedly, the design of the tax on digital advertising is administratively complex and it only makes sense if it is implemented at the federal level in the case of the United States[27] and, even better, if it is global in scope, starting with the European Union. Paul Romer[28] has offered a detailed blueprint of what a federal progressive tax on digital advertising revenue might look like in the United States.

THE DANGERS AND RISKS OF THE HUGE AMOUNT OF PERSONAL DATA COLLECTED AND ITS USE

Last, but no less important, regarding the dangers and risks, both in the private and the public sector, of the huge amount of personal data collected and its use, note that perhaps there are those who think that the negative effects of automation and digitization are being exaggerated, considering the diversity of figures available on the potential loss of jobs and that the adoption of new technologies takes time and is affected by many technical and political factors. For some (Figueroa, 2019), the main problem for most workers is that new technologies, particularly digitization, are going to change many aspects of their job. And that's because digitization is creating an enormous amount of data on a lot of new phenomena. And that data is in the possession of the big, well-known technology companies: Amazon, Apple, Facebook, Google, Microsoft, Alibaba, Tencent, among the most important. Some of that data is collected on social media, an issue that is being written about a lot, because of the serious threats to privacy that this implies. The other part is being collected in companies. In the latter case, the data describe the work processes, but also the people who carry them out. And that data can be used and are used (along with data obtained from social networks) to identify workers, creating profiles of personality and political and union ideas. As Acemoglu (2021) warms, there is evidence that AI it is clearly being used both for automation and for

[25] The Spanish White Paper on tax reform (Several Authors, 2022), devotes an extensive chapter to the taxation of the digitalized economy (and the taxation of what it calls "emerging economic activities") with a synthetic vision of the economic dimension of the digital economy in Spain, analyzing the cross-border electronic commerce of goods and services, the digital businesses of non-resident companies that monetize user data (collaborative economy platforms) and crypto-assets, including also an analysis of teleworking and digital content creators and their tax treatment.
[26] Daron Acemoglu and Simon Johnson, "How to Fix the Platform Economy." Mar 13, 2023. https://www.project-syndicate.org.
[27] The state of Maryland has passed in 2021 an advertising tax, and other states plan to follow suit, though experts say it's short-lived, arguing it violates the Permanent Internet Tax Freedom Act.
[28] *Taxing Digital Advertising.* https://adtax.paulromer.net/#nextPost. May 17, 2021.

tighter monitoring of workers, further depressing wages, and the labour force: "monitoring is a way of shifting rents away from workers towards employees, and this is not socially valuable" (Acemoglu, 2021, 29), to which must be added the psychosocial risks we have referred above.

It is remarkable that, in a recent report on digital transformation in companies, "only 18 percent of survey participants deemed ethical governance critical to success" (Hill *et al.*, 2022). Therefore, it seems necessary to control the data that society produces, those produced by people as workers, as consumers, as citizens. We need to understand the political and social impact of digitization when it comes to the use of data, because "if something is not done to remedy that private control of data is in the hands of a handful of individuals (sic), workers around the world will be seriously affected by their efforts to control the intensification of the use of data at work or to achieve the election of a government that includes the data as part of their agenda" (Figueroa, 2019; 61)[29].

Nevertheless, the dangers and risks of digitalization are not only in the private sector, but they are also found in the public sector and in the public policies that make up the welfare state and it seems convenient to expand on the analysis of the effects of its design.

On the one hand, we are seeing how public entities are investing in digital technologies that are useless or not proportional in terms of the abuse of rights they entail and their application in many cases to vulnerable groups. Virginia Eubanks' (2021) research on the digitization of social services in the United States is illustrative that the tools used, particularly in anti-poverty programs, targeting poor people and the "working" class. What they are doing is automating inequality, because under the objective of rationalizing subsidies and detecting fraud, they do nothing but use technology to create profiles of the poor, control them and punish them. And here the digital divide takes on enormous importance, we have seen it in Spain with the problems to access to request the Minimum Vital Income, with public administrations and citizens very affected by the COVID-19 pandemic and the restrictions that have been imposed to control its lethal effects, thereby increasing the previously existing inequalities for access to public services and benefits.

Another example is the family allowance scandal in the Netherlands. (*toeslagenaffaire*), when tens of thousands of families were flagged up as potentially fraudulent claimants of childcare benefits, without any proof, and forced to pay back the benefits received, driving many into poverty, some to depression and suicide. All of this was the consequence of a self-learning algorithm and AI system, launched in 2013, to create risk profiles of people in an effort to weed out benefits at an early stage to spot fraud, designed without checks and balances and not subject to human scrutiny. Two indicators were having dual nationality and a low income[30].

And one more example, again in Spain, where the Public Administration grants since 2017 to the most vulnerable families a discount on the electricity bill, the so-called social bonus. As we can see, that always happens with these social aids: according to government calculations, in 2019 some 5.5 million households were entitled to the aid, though it was estimated that only 2.5 million would request it and, in the end, 1.1 million families did. Applications are evaluated using an algorithm, BOSCO. The Civio organization demonstrated in 2019 that the automatic application had denied aid to people who were entitled to it[31].

[29] We learned from the press (on *eldiario.es*, October 7, 2020; EFE, September 2, 2020) that Amazon published two job offers from intelligence analysts, in which the job description included monitoring union threats, in a profile intended for research into funding and activities linked to corporate campaigns inside and outside the company, as well as protests, geopolitical crises and other sensitive issues for human resources and employee relations. The offers put union work, hate groups, terrorism, and hostile political leaders on the same level.

[30] As if that were not enough, in 2020 a journalistic investigation revealed that the tax authorities kept secret blacklists on people for two decades, which tracked both credible and unsubstantiated "signals" of potential fraud. Citizens had no way of finding out why they are on the list or defend themselves. The coolest thing is that the minister of the Department of Finance, on which the Tax Agency depended, in the next government was appointed Minister of Digitalization. Melissa Heikkilä. https://www.politico.eu/newsletter/ai-decoded/a-dutch-algorithm-scandal-serves-a-warning-to-europe-the-ai-act-wont-save-us-2/

[31] https://civio.es/tu-derecho-a-saber/2019/05/16/la-aplicacion-del-bono-social-del-gobierno-niega-la-ayuda-a-personas-que-tienen-derecho-a-ella/

The government corrected the mistake but did not agree to open its source code to be able to look for other possible mismatches. Civio went to court and three years later, the justice has given the reason to the Government arguing that it would violate the right to intellectual property held by the Government and would affect both public security and national defense. Sources from the Ministry of Ecological Transition insist that facilitating access to the source code could lead to *the hacking* of the system. Forgetting that both Spanish law and European Union regulations establish that when a public matter is subjected to automated decisions, that algorithm must be audited and submitted to an impact assessment, which obviously has not been done. And it gives rise to the so-called "efficiency paradox": "the implementation of algorithmic systems for the sake of efficiency that end up being inefficient, due to unforeseen issues when installing the system in real life, such as bugs, errors, or biases"[32].

On the other hand, when studying what happened in Denmark between 2002 and 2019, "the digitalisation of public sector administration and services delivery has entailed the transfer of responsibility for critical infrastructures to private actors. As a result, public sector capacity, and hence the ability to achieve public goals, has been undermined." (Collington, 2022; 313). What started out in many countries as a desire to improve services and make processes more efficient and, with the emergence or aggravation of public deficits after the Great Recession, as a means of saving the welfare state. But increasingly a new motive was added: to contribute to the growth of the private sector by reducing 'administrative burdens' for businesses. And in the case of Denmark this has meant "entrusted greater and greater parts of responsibility for IT to external consultants and private suppliers,' with adverse implications for governance and management of IT systems" (319). Going a step further, the use of public databases has been opened to the private sector, which can be seen as a way of reducing public activity, insofar as it has entailed the removal of state governance over how datasets are used and the failure to capture returns for the state as a reward for its investment in their development (Lazonick and Mazzucato 2013). It is no coincidence that, in many countries, the administrative department responsible for digitization is within the Ministry of Economy. Thus, the process of digitalization in the public sector, while presenting itself as a technical solution to different challenges, has obfuscate the ownership relationships of actors involved.

A further step in the use of digital technologies by governments are digital identification systems (IDs), including those in Estonia, India and the attempt made in Kenya, which has been declared illegal by its Supreme Court. Proponents of this technology argue that "digital identity programmes provide a unique opportunity for increased inclusivity, better financial participation, and wider access to government resources and initiatives."[33]. The Supreme Court of Kenya has declared it illegal on the grounds that there was no clear documentation of the data privacy risks, nor was there a clear strategy for measuring, mitigating, and dealing with those risks. These are the same arguments of those who oppose the system implemented in India, to which are added the possibility of using these systems to profile ethnic minorities or violate the privacy of residents and the fact that many digital identification systems have been developed through public-private collaboration.

Another example often cited is the Chinese "Social Credit System," a credit rating and blacklist for businesses individuals, social organizations and local governments that can be tracked and evaluated for trustworthiness in areas such as food safety, intellectual property theft and financial fraud. Several Western media and scholars have misreported the details and mechanics of the system, as individuals with debt obligations are restricted nationwide for buying train and flight tickets, wrongly deducing that there is a

[32] https://verfassungsblog.de/roa-the-paradox-of-efficiency/
[33]https://www.weforum.org/agenda/2022/03/kenyan-supreme-court-digital-id-online-privacy/?utm_source=sfmc&utm_medium=email&utm_campaign=2772344_Agenda_weekly-8April2022&utm_term=&emailType=Agenda%20Weekly Retrieved April 8, 2022.

centralized database in which each Chinese citizen has a numerical score, calculated with an algorithm, which is used for surveillance and social control, which seems not to be the case.

The European Commission adopted a proposal for the regulation of Artificial Intelligence in April 2021[34]. In a new move, in September 2022 the EU Commission introduced two new proposals of directives to adapt liability rules to the digital age. Firstly, a proposal for a novel AI Liability Directive, and secondly, a proposal to modernise the existing Product Liability Directive to better address digital products and the circular economy. The liability proposals and the AI Directive are inherently intertwined: the latter does not seem to protect either citizens or workers, insofar as is framed in terms of product safety and, as such, employment is not within its legal ambit (Ponce del Castillo, 2022); and the former lack specific, substantive rules on AI development and deployment. If the experts are heard, "(t)he dual proposals of the Commission on liability for AI take steps into the right direction, but they do not go far enough. Overall, the two half-hearted directives do not add up to one convincing approach. They fail to provide a uniform framework for AI liability in the EU which would balance ease of compensation with sufficient legal certainty for AI development and deployment. EU lawmakers should have the courage to enact one coherent regulation – not two disparate directives –, thereby truly harmonizing tort liability for products, including software and AI, at the EU level" (Hacker, 2023; 66). And besides that, it sets aside the risk that ICTs in general and AI in particular pose to climate change, for instance, allowing under certain conditions to place on the market or putting into service AI systems which have not undergone a conformity assessment.

The AI Act, which consists of 12 main titles and 180 articles, was passed by the European Parliament on 13 March 2024, and is expected to be published in the Official Journal at the end of the current legislature in May. After coming in force, there will be a delay before it becomes applicable, so its full effects will not begin to be seen for about four years, and it will need jurisprudence to know with what methodology the regulation is going to be implemented. This is not the most appropriate place to analyse the AI Act, so, in addition to the deficiencies listed in the previous paragraph, we will only make a couple of comments, on biometric identification and copyrights. Regarding the systems of biometric identification, the authorities can bypass the regulations, with the sole obligation to communicate its use no later than 30 days after their adoption, even if it is later declared that the use of the system has been inappropriate. And as far as copyright is concerned, the AI Act repeats throughout its articles that all systems must guarantee compliance with copyright, but it does not say how. Regarding the copyright of the content used to train algorithms already in operation, the regulation, more than a legal framework, is a declaration of principles and democratic values.

Moreover, we have learned that the European Parliament has approved a regulation that allows Europol (the police agency of the European Union), to open investigations into alleged crimes, to request data on people who are not in any of the five categories allowed so far, alleged perpetrators of a crime, alleged accomplices, previously convicted persons, witnesses, or victims. That is, Europol is allowed to conduct prospective investigations which, in many countries, are not admitted as evidence by courts. The data collected can be used to train AI algorithms, which develop tools to fight crime, which makes the non-binding statement of the European Parliament of October 2021, that made it clear that citizens should only be monitored when they are suspected of having committed a crime, since the tools supported by AI, such as facial recognition and predictive algorithms, they give rise to large inequalities, opposing police tools based on the use of AI[35].

[34] In 2022, two directives containing provisions and restrictions relevant to AI models have been adopted and published: the Digital Services Act published in the Official Journal as of 27 October and came into force on 16 November 2022; and the Digital Market Act published in the Official Journal as of 12 October and entered into force on 1 November 2022.
[35] Manuel G. Pascual: "Europol prepares its digital Big Brother: it will be able to process anyone's data". El País, May 27, 2022. https://elpais.com/tecnologia/2022-05-27/europol-prepara-su-gran-hermano-digital-podra-procesar-datos-de-cualquiera.html. These changes have come about through amendments to the Europol Regulation (Regulation (EU) 2016/794), that will come into force on 28 June 2022.

As Philip Alston has pointed out in his report to the United Nations General Assembly (Alston, 2019), whose pages have a great interest, so it is better to make a literal quote: it has emerged the *digital welfare state*, in which "systems of social protection and assistance are increasingly driven by digital data and technologies that are used to automate, predict, identify, surveil, detect, target, and punish… In such a world, citizens become ever more visible to their governments, but not the other way around." "(T)he embrace of the digital welfare state is presented as an altruistic and noble enterprise designed to ensure that citizens benefit from new technologies, experience more efficient governance and enjoy higher levels of well-being. Often, however, the digitization of welfare systems has been accompanied by deep reductions in the overall welfare budget, a narrowing of the beneficiary pool, the elimination of some services, the introduction of demanding and intrusive forms of conditionality, the pursuit of behavioural modification goals, the imposition of stronger sanctions regimes and a complete reversal of the traditional notion that the State should be accountable to the individual".

That is why, reconsidering how democratic control over public sector data and capabilities is asserted a critical task. When digital technologies are introduced into the welfare state, their distributive impact is often not a significant focus of Governments. The dignity dimension is at particular risk in the context of the digital welfare state. The assumption that there is always a technological fix for any problem is highly likely to be misplaced in various aspects of a humane and effective system of social protection. Digitalization is posing serious risks to welfare states, to the extent that it can lead to changes in public policies and their implementation. These changes are taking place both in the short and medium term. "In the short run, new types of employment and job loss due to automation will undermine the basic logic of insurance-based social security systems, but at the same time will reinforce the demand for adequate social protection against the financial consequences of under and unemployment. In the medium term, the digital transformation will increase the need for more social investment, while the redistributive pillar will become more contested due to the changing political space" (Busmeyer *et al.*, 2022; 13). For instance, one of the policy measures that is being proposed is the introduction of a basic income, although the reasons given by the defenders of this proposal go far beyond compensating for the negative effects of automation[36].

CONCLUDING REMARKS

To conclude, technology is a social relationship, and it should be remembered: technologies are built by specific people, companies, and organizations, so they embody and replicate the social norms, values and other economic, ecological, political, and cultural forces that always exist. Technology may be "neutral," but neither its design nor its application is. A technology, such as Artificial Intelligence, may be "fair", though the question to be asked is: how is shifting power?[37]. If technology reflects preordained or objectively "rational" and efficient outcomes, it risks abandoning human rights principles along with democratic decision-making.

In the best scenario, just as it is already recognized that globalization has led to winners and losers and that the reallocation of workers between sectors and countries is not without "friction" and will take many years, with costs equivalent to considerable years of loss of income for workers, "it is reasonable to think that the reassignments resulting from AI will face similar challenges" (Craglia, 2018; 79). And that by the time the compensations come to the losers, if at all, many will have fallen by the wayside. If the introduction of new technological breakthroughs, like AI, is focused, as it looks to be, on leveraging to cut labour costs, paring back employment and keeping wages as low as possible, and paying high dividends; if

[36] See Van Parijs and Vanderborgth (2017) for the history and rationale of the proposal, and Raventós (2021) for a detailed study of how a basic income can be financed in Spain.
[37] "When the field of AI believes it is neutral, it both fails to notice biased data and builds systems that sanctify the status quo and advance the interests of the powerful" (Kalluri, 2022).

instead of helping customer services, nurses, teachers and others to improve their outcomes, is designed and used to replace people, rather than to help them, then it will be a disaster, not only for workers[38], but also for all of us. In any case, the human species is the one that must decide how far it wants automation and digitalization to go, what kind of technologies are going to be developed and which ones are going to be applied, what are the public policies that are going to be adopted in this regard. The future of work will be what we want it to be, there is no determinism here.

Consequently, we must decide if we must submit, that we adapt to technology or if it should adapt to people, because what is happening is that automation and digitalization, as they are being implemented, in the business world, but also in some public policies, are modifying the balances of power necessary for democratic functioning and society as we understand it. And here the intervention of the State is crucial, because if in the case of the AI used so far, we have not yet been able to agree on its limits, new models, such as *generative* AI, have begun to permeate our society without any control. "There is no time to lose because the furor of the market is marking the times and pushing too rapid development without taking into account the consequences that the massive deployment of this type of technology can cause" (Lucía Velasco: "The new creative revolution is called generative artificial intelligence". *El País*, February 20, 2023). Even more, when asked about the existence of a human-level AI, the majority of those who study this question believe that there is a 50% chance that transformative AI systems will be developed within the next 50 years, although it should be noted that there is no consensus, and the uncertainty is high about when will be developed[39].

In fact, there are those who claim that a superhuman artificial general intelligence is coming soon. We see that almost every month new developments are announced, which increase the optimization power and breadth of your applications. In fact, with the emergence of GPT-4, the company that owns it OpenAI suggests that artificial general intelligence will be created and will most likely be active before 2030.

Contrary to what some write, nothing indicates that we are facing the end of the most disruptive phase of this digital revolution and that a possible new landscape appears on the horizon with a more widely distributed prosperity, undoubtedly a mirage caused by the recent layoffs of the big technology companies and by the fall in their incomes. The positive effects that Information and Communication Technologies may have had on productivity, including AI, have ceased to manifest themselves since 2005 and what has happened is that, in the absence of adequate public policies, this new technological revolution is showing its negative effects, not only on growth and institutions, also on the social structure. In reference to the economic effects, that "ICT and AI have helped some superstar firms develop platforms/networks or social capital which in turn have acted as barriers to entry and/or innovation by non-superstar firms", as highlighted by Aghion, Antonin and Bunel (2019; 153), having increased the degree of business concentration and oligopolization, as we have already found. It is not just a problem related to competition policy, a very narrow view of the problem, but of the design and implementation of all public policies relating to automation and digitalization.

It must be known that, in previous technological revolutions, there was an initial period of strong accumulation by capital, with great suffering for the working class and great inequalities, but the benefits only began to reach workers after four or five decades had passed, a delay that has been called the

[38] "Executives pursue these cuts because it is what the smart kids (analysts, consultants, finance professors, other executives) say they should do, and because Wall Street judges their performance relative to other companies that are also squeezing workers as hard as they can." Daron Acemoglu and Simon Johnson, "What's wrong with ChatGPT?" *Proyect Syndicate.* February 6, 2023.
[39] Max Roser. "Here's how experts see AI developing over the coming years." *World Economic Forum*, February 16, 2023. https://www.weforum.org/agenda/2023/02/experts-ai-developing-over-the-coming-years/

"Engels pause".[40] But this was possible, in large part, thanks to the organization of the working class and its struggles, to the social pacts, it was not something that came by itself. The problem we face in this new technological revolution is that the power of the workers has decreased drastically, as shown by the significant decrease in union membership rates, that the compensatory power has been greatly weakened, which is ultimately preventing the benefits from reaching the workers, with explicitly anti-union corporate policies, encouraging individual versus collective bargaining and with companies outsourcing and subcontracting more and more Labour[41]. Moreover, in this technological revolution, teleworking exacerbates the disappearance of that compensatory power. We must therefore be pessimistic about the prospects for better working conditions and higher and better distributed average levels of well-being, at least in the so-called "developed" countries, thanks to the effects of digitalization, in particular AI: it seems more likely this time the "Engels pause", at best, it's going to be much longer, if not extended indefinitely (Allen, 2017).

The launching with an immediate success of the generative Large Language Models, like ChatGPT (Generative Pre-trained Transformer, developed by Open AI, the GPT3 version was first introduced in June 2020 and the GPT4 was introduced in March 2023) or BERT (Bidirectional Encoder Representations from Transformers, developed by Google, first introduced in 2018), and the incorporation to the Microsoft's Bing search engine and the Edge browser of the Prometheus Model, a version of ChatGPT, while Google announces that it incorporates to its search engine the chatbot Bard (Blender-based Architecture for Dialogue), based on LaMDA (Language Model for Dialogue Applications), is a new example that behind the development and use every technology there is a political decision.

That it is not a question of preventing or delaying the development of this technology, as naively? some propose, it is a question of containing and controlling the dangers involved in its use, of ensuring that with its use, for example in companies and public administrations, there is no prejudice or discrimination, that we cannot fall into the trap of private companies developing AI models, like Alphabet, Meta and OpenAI, which decide with their enormous market power, what kind of regulation is to be applied that, as is well known, will be in their own and exclusive benefit. We must remember that these AI models have privatized without permission the contents of the Internet, violating pre-existing laws such as intellectual property, some have called them "plagiarizing machines". And that the data with which the model has been trained to recognize patterns and relationships in the text, if they are biased, make their answers reproduce those biases, even talking about producing "hallucinations", by confidently affirming statements of fact that do not seem to be justified by their training data. It is, in short, that it is governments and not private companies, that develop rules that allow to see why AI algorithms make the decisions they make and that it is known who is responsible, that there is transparency, guaranteeing the legality of the data used when training their technological solutions, as well as adopting preventive measures that avoid discrimination when creating algorithms and when using the information collected. And it is certain that it will not work for each government to develop its own regulation, hence the creation of an international agency for AI is being proposed. But in the meantime, what is really needed is that there is collaboration between countries, so that their approaches and requirements are at least aligned.

[40] The Engels pause is a term coined by economic historian Robert C. Allen (2009) to describe the period from 1790 to 1840, when British working-class wages stagnated, the rate of return to capital raised and per-capita gross domestic product expanded rapidly during a technological upheaval.
[41] I thank Bruno Estrada for drawing my attention to this point. Isabel Schnabel (2022) provides information on the compensated average (by GDP) of trade union membership density for Austria, Belgium, France, Germany, Italy, the Netherlands, Portugal, and Spain, which peaks in 1978 at 38% of employment, and has since fallen steadily to 19% in 2019, a decline incidentally parallel to that of the share of wages in Gross Value Added. For the United States, the affiliation rate in the private sector has gone from a maximum of 33% in the fifties of the last century to 6% in 2019 (Stansbury and Summers, 2020). Data on trade union membership and collective bargaining coverage is found in https://www.oecd.org/employment/ictwss-database.htm.

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