

THE DUAL IMPACT OF ARTIFICIAL INTELLIGENCE: CATALYST FOR INNOVATION OR THREAT TO STABILITY

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Abstract. The article presents issues of scientific policy, integration in the European educational and scientific space, results of scientific research and discussions on the issues of the fifth industrial revolution. The research focuses on an analysis of perspectives on global technological growth based on the impact of artificial intelligence. According to the pessimistic forecast, the digital revolution is already a fact, and its impact on productivity is almost over. On the optimistic side, futurists argue that technology and innovation have reached inflexion points.

Keywords: 5th industrial revolution; artificial intelligence; threats, opportunities; Industry 5.0

JEL: O1, O3, P2

Introduction

The scale and scope of the technological revolution unfolding before our eyes are producing economic, social and cultural changes of such phenomenal proportions that they are almost impossible to predict (Ford 2021). An increasingly dynamic business environment requires adaptability and innovation. Against this backdrop, artificial intelligence (AI) is positioned as a promising solution to address these challenges. With the help of powerful tools like machine learning and neural networks, AI can revolutionise many sectors of the economy. However, like any new technology, AI has its risks that must be carefully analysed and addressed (Molhova and Biolcheva 2023).

In all of these risk areas, perhaps the most critical impact is likely to arise from a single force: *empowerment* – in other words, how governments treat their citizens, how businesses treat their employees, shareholders and customers, or how superpowers treat smaller countries (Modise 2023). In this sense, the subversive impact that the Fifth Industrial Revolution (Industry 5.0) will exert on existing

political, economic, and social models will require empowered actors to realise they belong to a system of distributed power. This system will successfully function, but more joint forms of interaction are needed. AI is used as an “opportunity multiplier” and time saver. It obliges specialists to develop a view of the big picture and not focus only on the code but on the final product and the specific needs of the users that are being solved – this is one of the messages that the software sector sends to young talents (Ford 2021).

This paper attempts to analyse the potential impact of Industry 5.0, fuelled by the exponential growth of AI, on the economy, business, governments and countries, society and individuals. For this purpose, key variables were analysed – economy, ageing, productivity, education and qualification, human labour, and a sense of purpose.

Economy

There are two perspectives on economic growth: “*Techno-pessimists*” argue that the critical contribution of the digital revolution is already a fact and that its impact on productivity is almost over. “*Techno-optimists*” believe that technology and innovation have reached inflexion points and will soon unleash a wave of productivity and higher economic growth (Ford, 2018).

Perhaps the truth is in ***pragmatic optimism***. The fact is the potential deflationary impact of technology (even when defined as “beneficial deflation”) and how some of its distributional effects can benefit capital at the expense of labour and reduce wages (and hence consumption). On the other hand, Industry 5.0 enables many people to consume more at a lower cost and in a way that often makes consumption more sustainable and, therefore, more responsible (Todorova et al. 2018).

It is essential to place the potential growth impacts of Industry 5.0 in the context of current economic trends and other factors that contribute to growth. In the years before the economic and financial crisis, starting in 2008, the world economy grew by about 5% per year. At the same rate, global GDP would double every 14 – 15 years, and billions of people would be lifted out of the poverty trap (Schwab 2021). In the immediate aftermath of the Global Recession (2008 – 2009), expectations were widely shared that the global economy would return to its previous pattern of high growth. However, this did not happen. The global economy is “stuck” in growth rates that are lower than the post-war period (World War II), *i.e.* about 3 – 3.5% per year (Gaspar 2020).

Summers and Krugman dust off a term coined during the Great Depression by Alvin Hansen – *secular stagnation* (permanent stagnation), which describes a situation of persistent demand deficits that cannot be overcome even with near-zero interest rates (Hansen 1953). The reflection, though disputed by science, is remarkable. In case we accept the thesis, it means that global GDP growth will decrease more and more. In an extreme scenario, where annual global GDP growth falls to 2%, it would take 36 years for global GDP to double (Summers 2017; Crugman 2020). There are many

explanations for today's slower global growth, including capital misallocation, over-indebtedness, changing demographics, and so on.

Productivity

In recent years, global productivity has plateaued, even as technological advancements and investments in innovation have surged. This disconnect between technological progress and productivity growth is a perplexing puzzle of our time, akin to the unexplained global recession that occurred a few years ago. Productivity is the most crucial determinant of long-term growth and rising living standards, so its lack, if it continues through Industry 5.0, will result in less growth and lower productivity (Schwab 2021).

The disconnect between the expectation of higher productivity from technological advancements and the reality of stagnant productivity can be attributed to challenges in measuring inputs and outputs. Industry 5.0 innovations often introduce unique products and services with higher functionality and quality, but they are delivered in radically different markets (Gueorguiev and Kostadinova 2021). These products may have zero marginal cost, be highly competitive due to digital platforms, and lead to lower prices. Traditional statistical methods may struggle to capture the true value increase because consumer surplus isn't reflected in sales or profits (Crugman 2020).

The combination of structural factors like over-indebtedness and ageing populations, along with systemic factors like the rise of platform-based on-demand economies and the declining importance of marginal costs, necessitates a rethinking of economic principles. Industry 5.0 offers the potential to boost economic growth and address some of the world's most pressing challenges. However, it's crucial to acknowledge and manage the negative impacts that productivity can have, especially on inequality, employment, and the labour market. Issues such as impacts on developing economies, employment, labour replacement, examples of occupations that are the most (telemarketers, tax return preparers, insurance appraisers, referees, sports referees, court clerks; waiters; real estate brokers, those working in agriculture, secretaries – except legal and medical; couriers) or the least susceptible to automation (social workers in mental health and addictions, choreographers, doctors and surgeons, psychologists, computer systems analysts, anthropologists and archaeologists, ships engineers and mechanics, sales managers, CEOs) and the impact on skills is really critical to the development of human capital, which places the requirement to develop social and creative skills, and in particular – decision-making in a situation of uncertainty and the development of new ideas.

Impact on education and qualifications

In the near future, low-risk jobs in terms of automation will likely be those that require social and creative skills, especially decision-making under uncertainty and innovation. However, this may not last long (Schwab 2021).

One of the most creative professions – *writing* – and the emergence of automatically generated narration – can serve as an example. Sophisticated algorithms can create meaningful text in any style suitable for a specific audience. The content sounds so human, according to a New York Times survey, that it is impossible to tell between two similar works which are written by a human and which are the product of a robot (Lee 2023). Technology is advancing so quickly that Christian Hammond, co-founder of Narrative Science (a company specialising in automated text generation), predicts that by the middle of the third decade of the 21st century, 90% of news stories could be created by an algorithm, without any human intervention (except for the design of the algorithm itself, of course). In such a rapidly evolving work environment, the ability to anticipate future employment trends and the knowledge and skills needed to adapt becomes increasingly essential for all stakeholders (Manjoo 2018).

The impact of AI on jobs and skills will vary across industries and regions. A recent survey by the World Economic Forum found that HR directors in major companies predict a growing demand for complex problem-solving, social skills, and systems knowledge by 2025. These skills will be more valuable than physical abilities or content-based skills (WEForum 2023). According to Klaus Schwab, the next 5 years are a critical period of transition. The overall employment forecast does not change, but there is a significant increase in unemployment within various industries and an increase in the required skills in most occupations (cognitive abilities, skills related to systems, complex problem solving, content-related skills, resource management skills). While most occupations are expected to see a slight increase in wages and a better work-life balance, job security is forecast to worsen in half of the industries surveyed. It is also becoming clear that women and men will be affected differently, potentially exacerbating gender inequality (Schwab 2021).

In the future, we can expect the emergence of many new professions and job roles, driven not only by Industry 5.0 and AI but also by demographic changes, geopolitical shifts, and evolving social and cultural norms. While we can't predict the exact nature of these new roles, talent will undoubtedly play a crucial role in driving production (Dunn 2020). As Biolcheva and Sterev (2024) point out, a significant obstacle to harnessing the full potential of AI is the lack of technological expertise within organisations. This shortage of skilled labour, rather than a lack of capital, is more likely to hinder innovation, competitiveness, and growth.

The result could be a labour market that is increasingly divided into low-skilled (low-paid) and high-skilled (high-paid) segments. Software entrepreneur Martin Ford calls the entire base of the labour skills pyramid “*slumping*”, which, in turn, leads to greater inequality and increasing social tension if we do not prepare for this process (Ford 2021).

Such pressure forces us to reconsider even the understanding of “*high qualification*” in the context of Industry 5.0 and the age of AI. Traditional definitions of qualified LF rely on having specialised or advanced education and a

set of specific abilities within a given profession or area of expertise (Atanasova and Venelinova 2022). Given the increasing rate of change in technology, however, Industry 5.0 requires and places much greater emphasis on the ability of workers to continuously adapt and learn new skills and approaches in different contexts (Atanasova 2023).

Among the main obstacles to a more decisive approach are, for example, companies' lack of understanding of the nature of disruptive changes, weak or even non-existent alignment between LF strategies and the innovation strategy of the same company, resource constraints and pressure on short-term profitability. As a result, there is a disparity between the scale of the changes taking place and the relatively minor actions taken by companies to meet these challenges. Organisations need a new way of thinking to meet their need for skilled workers and mitigate undesirable social outcomes (Ford 2018).

The nature of human labour

In his book *Free Agent Nation: The Future of Working for Yourself* Paperback (2002), Daniel Pink describes the emergence of a world in which the dominant work model is a series of contracts between employees and companies rather than permanent relationships. Technological innovation greatly accelerates this trend. Technological innovation greatly accelerates this trend. Today, the on-demand economy is fundamentally changing the relationship between labour and the social structure in which it is embedded. More and more employers are using the “*human cloud*” to do their jobs.

Professional activities are broken down into precise tasks and discrete projects, then “thrown” into a virtual cloud populated by ambitious workers located in different parts of the globe. This is the new on-demand economy, where labour providers are no longer employees in the traditional sense but rather independent contractors who perform specific tasks. As Arun Sundararajan, a professor at NYU's Stern School of Business, says in a New York Times, we could end up in a future where a small fraction of LF will be doing all sorts of tasks for generating income – simultaneously as an Uber driver, Instacard shopper, Airbnb host, and Taskrabbit helper (Sundararajan 2016).

The benefits for businesses, and especially fast-growing startups, in the digital economy are clear. Because human cloud platforms classify workers as self-employed – they are exempt – at least for the time being – from paying minimum wages, employer taxes and social security. For people who are in the cloud, the main advantages are the freedom (to work or not) and the unparalleled mobility that they enjoy because of belonging to the global virtual network. Some independent workers see this as an ideal combination of a lot of freedom, less stress and greater job satisfaction (Ion 2020). Although the “human cloud” is in its infancy, there is already evidence that it is leading to a tacit outsourcing of activity outside of developed countries ('tacit' because human cloud platforms are not officially listed on a stock exchange and are not required to disclose their data).

Is this the start of a new and flexible labour revolution that will empower anyone connected to the Internet and eliminate the skilled LF shortage?

The rise of the 'precariat,' a class of workers who struggle to make ends meet by juggling multiple jobs while losing job security and labour rights, is a potential consequence of the unregulated virtual exploitation enabled by Industry 5.0. This could lead to significant social unrest and political instability (Deneva et al. 2022). The development of the 'human cloud' might further accelerate the automation of human jobs. To avoid these adverse outcomes, we need to develop new forms of social labour contracts that adapt to the changing nature of work and prevent exploitation. Failing to do so could lead to a 'dark side' of the future of work, characterised by fragmentation, isolation, and exclusion (Dunn 2020).

The choice is humanity's. The future depends entirely on policy and institutional decisions. We need to be aware that strong regulatory pressures are possible, which could entrench politicians' power and overload a very complex system's adaptive power.

Ageing population

The world population is expected to grow to 9 billion in 2050. This should increase aggregate demand. This trend is countered by ageing, which is said to affect wealthy Western European countries mainly. The facts, however, are different. Birth rates are falling below natural population replacement levels in many regions of the world – not only in Europe, where the process described begins, but also in South America and the Caribbean, much of Asia, the Middle East and North Africa, represented by Lebanon, Morocco and Iran (Crugman 2020).

Ageing is an economic challenge because, unless retirement years are increased dramatically so that older members of society continue to participate in the workforce (an economic imperative from which there are many benefits), the working-age population will decline. The percentage of financially dependent older adults is increasing. Aging and a smaller number of young people are factors in reducing purchases of luxury goods such as housing, furniture, cars and household appliances. Also, fewer people tend to take entrepreneurial risks because older workers are more likely to preserve the assets they need for a worry-free retirement rather than start new ventures. This is somewhat balanced by the fact that as people retire, they begin to draw from accumulated savings, which ultimately lowers the savings and investment rate (Schwab 2021).

These habits and patterns are likely to change as ageing societies gradually adapt. Still, the general trend is that an ageing world is doomed to grow more slowly unless Industry 5.0 sparks a more significant leap in productivity, broadly defined as the ability to work more efficiently, not with more effort.

Industry 5.0 makes it possible to live longer, healthier and more active lives. We live in a society where over ¼ of the children born today in developed economies are expected to live to be 100 years old (Schwab 2021). Therefore, the concept of

the working-age population, retirement and individual life planning will have to be rethought. Failure to raise a discussion on these issues speaks to a lack of adequacy to actively acknowledge the forces of change.

The importance of a sense of purpose

Another aspect we should not forget is that it is not just about talent and skills. Technology allows for greater efficiency, which is what most people want. In addition, however, they want to live with the feeling that they are not just a cog in some faceless machine but part of something larger – something more significant than themselves. Even Karl Marx expressed concern that the process of specialisation would diminish the sense of meaning we all seek to derive from our work, and Buckminster Fuller warned that the risks of over-specialisation could exclude demand on a broader bandwidth and thus stop further discoveries of all-powerful general principles.

In today's complex and hyper-specialised world, finding meaningful work is becoming a challenge, especially for younger generations who often feel limited by traditional corporate jobs. As boundaries blur and aspirations evolve, people seek not just a work-life balance but a harmonious integration of personal and professional life (Dunn, 2020).

It's concerning that the future of work may only offer a select few the opportunity to achieve such fulfilment.

Business and the sources of subversive influences

In addition to changes in growth patterns, the labour market, and the future of work, which will naturally impact all organisations, there is already evidence that the technologies that underpin Industry 5.0 significantly affect the way organisations are run and financed (Sundararajan 2016).

Businesses are facing disruption from various sources, including technological advancements and innovative competitors. New technologies like energy storage and 3D printing are reshaping industries and disrupting traditional value chains. The availability of global digital platforms for research, development, marketing, and distribution allows nimble competitors to quickly overtake established players by offering superior products or services (Dunn 2020). Even large traditional companies can leverage their existing assets to enter new markets and disrupt established industries. The key is for the business to adapt to these changes and embrace innovation to remain competitive. (Schwab 2013).

The flood of information that floods us today, the speed of disruptive developments and the acceleration of innovations are complex phenomena to understand or predict. In this rapidly changing landscape, one thing is certain - the leaders must be adaptable and open to learning. They need to continually question their existing models of success and be prepared to embrace new approaches. The

ability to work quickly and flexibly will be crucial for navigating the challenges and opportunities presented by these rapid changes (Schwab 2013).

Conclusion

Industry 5.0 and the accompanying discoveries in artificial intelligence undoubtedly hint at a huge potential for innovation and development. Automating routine tasks promises to free man and allow him to indulge in more creative and intellectual pursuits.

It is important to emphasise that considering Industry 5.0 does not mean that Industry 4.0 (the Fourth Industrial Revolution) is over. Some of the aspects identified in this paper as opportunities or threats are clearly not attributable to Industry 5.0 alone.

Innovations and discoveries in artificial intelligence influence specialists' expectations that Industry 5.0 will expand the strengths of Industry 4.0. As a result, companies will become even more adaptive and oriented to the future and people. Another goal is to improve networking and collaboration across the value chain further, creating a closer relationship between customers, suppliers, and partners. Many are united around the claim that the development of new technologies will create new jobs and stimulate economic growth.

At the same time, the opposition claims that the Fifth Industrial Revolution poses a number of challenges to society and the economy. The ageing of the population, changes in the labour market, and the need for continuous training and adaptation to new technologies are just some of them. It is argued that in order to make the most of the benefits of artificial intelligence and other innovations, one must seek and achieve a balance between automation and the human factor. This includes investing in education and skills, developing policies to stimulate innovation, and creating social networks to support people affected by these changes. Only in this way can we ensure that the future will be fairer and more prosperous for all.

The changes brought about by Industry 5.0 and artificial intelligence are inevitable. The question is *how we deal with them*.

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