

**SECTION ECONOMICS, BUSINESS ADMINISTRATION,
TOURISM AND STATISTICS**

**THE ECONOMIC IMPACT OF ARTIFICIAL INTELLIGENCE AND THE
DILEMMAS SURROUNDING THE LABOUR MARKET**

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Abstract: *The study focuses on the concerns and opportunities surrounding artificial intelligence. The research questions associated with the study focused on the economic impacts related to AI and the additional dilemmas that arise concerning the adaptation of AI. Therefore, the study discusses the beneficial effects of AI on the economy as a whole, the labour market, and specific processes. At the same time, concerns are raised about labour and security dilemmas, including job insecurity, fear of losing jobs, data distortions and false outcomes. The topic is considered to be highly up-to-date, with a particular focus on the opportunities and concerns related to the changing trends in the labour market, which is being researched by several authors in international academic fields. As regards the methodology, it is a theoretical, descriptive research aiming to examine and accurately describe the topic and its effects from multiple perspectives. It is essentially based on qualitative data already available, supported by quantitative statistical data and forecasts. The approach of the research is based on a joint analysis of economic and security dilemmas and opportunities, in combination with examples and case studies related to the topic. The study analyses the impacts in general terms; however, it can be concluded that the impacts appear differently depending on how governments and companies can exploit the potential of AI. Generally, society still relies excessively on interpersonal relationships, thus, the replacement of processes by artificial intelligence is still limited, regardless of the current level of technology.*

Keywords: *AI; economy; labour; efficiency; dilemmas*

JEL Classifications: *E0, E2, F6, J2, O1, O3, O4*

1. Introduction

Given recent technological trends, the development and adaptation of digital technology and increasingly complex processes are having a significant impact on both the social and economic spheres. The business environment is constantly changing, shaping the economy, including organizational and management strategies, the way companies interact with each other and the labour market as a whole. Technological advances in artificial intelligence and their impact on social and

economic processes have become one of the most current issues of our time, as evidenced by the dynamic growth of the AI market globally.¹

The main research questions of the study are:

- What economic effects are associated with the application of AI?
- What concerns and security dilemmas are associated with AI?

Public opinion on AI is divided, with common assumptions such as “AI will take people’s jobs”, “human capital will disappear from the labour market”, or the ongoing development of AI, robotics and machine learning being referred to as a “curse”. The basic aim of the current study is to dispel the doubts about these assumptions, highlighting the potential and concerns of AI for the labour market.

2. The general economic impacts of artificial intelligence

The impact of AI on the economy can take several forms:

- Changes in working methods and tools used in the work process;
- Negative labour demand effects due to artificial intelligence replacing human decisions;
- Changes in management and decision-making to improve the effectiveness of governance;
- Replacement of existing jobs, creation of new industries and departments;
- Income growth, rising living standards;
- Reduced production costs, improved labour productivity;
- Fostering economic development and social progress (Aly, 2020).

There is also concern among economists that AI reduces the number of jobs and contributes to the increase in inequality that has been observed since 1980 (Acemoglu et al., 2023). These trends are most relevant for developing countries with a substantially high youth unemployment rate. Within the scope of economic development, technological reforms — including artificial intelligence — are contributing to GDP growth differently across sectors. Optimistic projections suggest that the introduction of AI could contribute 1.5 percentage points per year to productivity growth over 10 years and could increase global GDP by up to 7% (7 trillion USD in additional output) (Goldman Sachs, 2023; Acemoglu and Johnson, 2023).

Global statistics show that the development and productivity effects of artificial intelligence will lead to a significant increase in gross domestic product across different sectoral activities by 2030 (Statista, 2025). The most affected sectors are expected to be public and personal services and hospitality. As already outlined by Schumpeter, technological progress is not the same for all sectors of the economy but can have a more significant impact on certain sectors (Schumpeter, 1961). However, technological innovations not only affect various sectors and industries in different ways but also have other degrees of impact in different regions, depending on the economic development of the area and the availability of the capabilities and opportunities to adapt new technologies.

¹ By 2031, the market size of artificial intelligence is estimated at 1.01 trillion USD (Statista, 2025).

Rapid adaptation boosts revenues, supports industries, develops global value chains and drives economic growth. Digital transformation and innovation have positive impacts on society, culture and the environment, while expanding internet access and increasing demand for knowledge-based labour (Aly, 2020).

Key findings: Technological progress has an undoubtedly significant impact on economic growth and development. Despite the proven positive effects of the adoption of AI on economic growth and development, it is also projected to exacerbate concerns about rising inequality. In addition to differences in applicability across industries, it may also increase divergence between countries, leading to further underdevelopment and further stagnation in developing regions. Leading countries in technological development may face competition and thus technological and political conflicts (e.g. USA and China).

3. Trends in productivity and efficiency

Increased productivity leads to lower prices and higher real incomes, which positively affect output and labour demand (Learning People, 2022). Automation enables machines to learn new skills faster (Ernst, 2022), and AI reduces repetitive tasks, improving productivity (Ramachandran et al., 2022). There is a positive relationship between digital transformation, economic development, labour productivity and employment. AI generates new labour, stimulates efficiency, adds to capital and fosters innovation (Aly, 2020). Firms that adopt AI generate higher revenues, which improves labour productivity and the workplace environment. AI analytics helps to process the data and process control systems (Ramachandran et al, 2022). However, it cannot be integrated into every production process. Integrability into systems depends to a large extent on the systems, production processes and technology used, but also on data collection techniques and the systematic nature of existing data, factors that depend on the existing human workforce and management decisions (Yang, 2022). Some companies claim that automation is aimed at increasing efficiency and improving the quality and providing faster service. McDonald's referred to the efficiency of fast service and fewer errors after automation. Tesla highlighted the efficiency of automating data tagging (Marx, 2023). The push for efficiency can take two forms, depending on the policy of the organization. A negative example is when companies seek to achieve higher levels of efficiency through stricter monitoring of employees, which is achieved by incorporating computer monitoring software such as keystroke tracking or software that evaluates employee movements (Marx, 2023). These actions can have several negative consequences that can be destructive to the work environment. Stress and insecurity at work can appear, leading to a deterioration in employee performance. It also reduces trust between management and employees and worsens the relationship between employees, which has a negative impact on work culture. Excessive control tends employees to change jobs. This kind of performance-driven business policy erodes morale and can reduce labour supply.

On the other hand, the use of artificial intelligence can help employees work to achieve efficiency for the organization. AI allows restructuring roles, reduces

repetitive processes and the time spent on them, and therefore contributes to faster and more efficient decision-making. However, its implementation requires training and retraining of employees and the willingness to adapt to the trends expected for the effective use of AI (Kiderlin, 2023). In terms of value creation, the contribution of AI to existing processes varies depending on the industry. Internationally, the estimated growth rate of gross value added by industry is illustrated in Figure 1 for the year 2035.

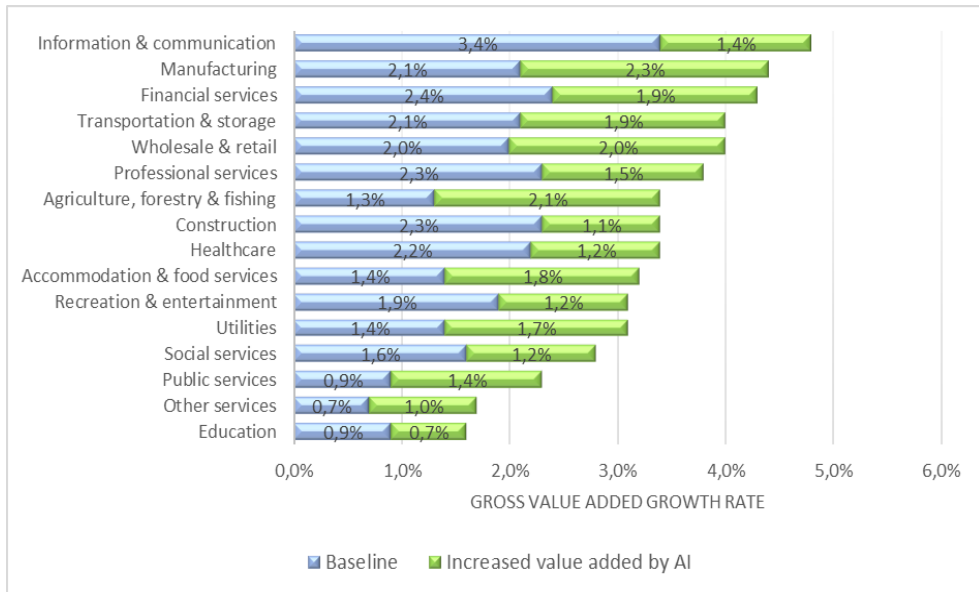


Figure 1: Impact of artificial intelligence on the growth rate of gross value added worldwide, by industry (2035)

Source: Thormundsson (2022)

The chart shows that the highest gross value added is in the information and communication sector, followed by manufacturing and financial services. AI value added is highest in manufacturing, but shows a comparable 2% increase in value added in sectors such as agriculture, forestry, fishing, wholesale and retail trade, and finance, transport and storage (Thormundsson, 2022).

Key findings: The impacts on the economy are complex and somewhat contradictory, not equally across countries with different levels of development or across sectors within the economy. AI can make certain processes more efficient, but the extent of the impact is also strongly influenced by the attitude of governments and decision-makers towards technological developments and the adaptation of new technology. Companies need to think carefully about the implementation of AI, as there are many factors and potential consequences to consider in addition to optimized efficiency and productivity. In addition to the issue of industry applicability, ethical and human aspects are both of key importance and can have an impact on the success of an organization's operations.

4. Impacts on the labour market

The effects of artificial intelligence on employment include mass unemployment and a rearrangement of labour market trends, which may increase wealth inequalities (Faggella, 2019). The concept of technological unemployment has been around since the 1930s (Keynes, 1997). In his 1995 book, Jeremy Rifkin predicted the loss of millions of jobs due to the development of information technologies (Rifkin, 1995). Since the 2000s, the development of robotics and digitalization has been steadily reducing the burden on human resources, automating production processes more efficiently and faster, and shifting human concentration towards more complex activities and processes (Urwin, 2023). This phenomenon has been seen as a similar trend in the past, for example, when computers were introduced and specialized machines replaced human labour in factories and agriculture. The new technology — then considered an innovation — brought changes in working methods and replaced part of the human workforce. However, in most cases, the workforce was simply redeployed or the functions changed which had previously been assigned to the job (Kiderlin, 2023). Martin Ford argues that jobs that can be easily automated are being lost in sectors where machines can effectively replace human labour. He also highlights the increasing divergence resulting from technological progress, with the consequence that labour market effects are not equally reflected in economies with different levels of technology (Ford, 2018). The economic inequalities brought about by AI increase the gap between those who benefit from AI and those who are left behind (Ford, 2022). In influencing the labour market, a distinction can be made between the direct replacement of employees and an increase in demand due to technological development. These factors can lead to concerns about the replacement of humans by AI systems in certain sectors and jobs (Chernov and Chernova, 2019).

According to a 2014 analysis by *The Economist*, 47% of jobs could be lost by 2034 due to automation, especially in self-driving technology (*The Economist*, 2014). Nevertheless, the demand for truck drivers has since increased (Marx, 2023), as confirmed by International Road Transport Union data. In 2022, there was a shortage of 380,000 drivers in Europe, accounting for 10% of total demand (Truck Mobility Info, 2023; International Road Transport Union, 2022). In addition, autonomous driving technology requires significant human resources, often provided by low- skilled labour in developing countries. According to a survey by Odoxa (2018), 37% of French respondents considered the replacement of jobs by AI as the main risk, 34% considered the replacement of human decision-making by AI, while 28% were also concerned about the loss of control (Thormundsson, 2024). Based on the World Economic Forum's (2020) Future of Jobs Report, by 2025, 85 million jobs could be lost due to the human-machine division of labour, but 97 million new roles could be created. Machines performed 34% of the jobs in 2022, which could increase to 43% by 2027 (World Economic Forum, 2023). The adaptation of technology also requires human resources; the more a country or a sector can integrate technology, the more people are required to do so (Simon, 2022).

According to the most recent reports (2025), advances in artificial intelligence and related technologies could create around 19 million jobs over the next five years, while the displacement of roughly 9 million positions is predicted. Certain

debates suggest that up to 170 million new roles could be created over the decade. The general trend points to a shift in work attitudes and support roles that emerge human skills and technological capabilities (World Economic Forum, 2025; Mavunga, 2025; Werner, 2025).

4.1. Job insecurity

The introduction of AI leads to job losses and job cuts as production efficiency increases (e.g. in manufacturing). This can lead to job insecurity and structural unemployment, which raises the need for requalification (Liu and Zhan, 2020). An ethical dilemma is the question of corporate responsibility: to what extent should they participate in the requalification or relocation of employees? To mitigate this issue, continuous learning and knowledge updating are essential, as emphasized by Ford (2018) and Rifkin (1995). At the individual level, workers must develop marketable skills to adapt to the changing labour market.

According to a survey by Koo et al. (2021), hotel industry workers had an ambivalent reception to the introduction of AI. Although they were concerned about jobs, they acknowledged that AI could relieve their workload and improve customer satisfaction. While some guests still prefer personalized services, demand for contactless solutions has also increased in recent years, particularly as a result of COVID-19.

The use of AI in the healthcare sector is surrounded by job loss concerns and adoption issues. Also, many patients — especially the elders — establish a trusting relationship with doctors and the credibility of diagnoses is a critical factor (Stewart, 2023). The current market share of AI in the healthcare sector reaches 15.7% (Statista, 2025). Automation has a potential of 28% and creates new roles, such as AI-based health technicians² (Daugherty et al, 2023; Learning People, 2022). AI supports accurate diagnosis and personalization of treatment, for example, in the detection of cancer lesions (Sriram et al., 2021). Although its effectiveness is proven, the uptake of AI-based tools is slowed by interdisciplinary challenges³ in healthcare (Pise et al., 2022).

Although AI has great potential in the social sector, it is not completely feasible to replace the human workforce. The forecasts are controversial, as technology cannot replace empathy and social intelligence, which are crucial in these areas. In general, frequently changing tasks require adaptability and flexibility, and therefore, such tasks are more difficult to replace with technology. The likelihood that AI will fully replace jobs requiring interpersonal skills is low — for example, the job of a therapist (Kiderlin, 2023).

Key findings: Overall, technological developments may lead to the change or disappearance of many occupations and jobs in the future, resulting in job insecurity that can have a negative impact on the physical and mental health of workers, as

² AI-based health technicians assist in medical diagnostics, remote monitoring, personalized treatment, robotic surgery, virtual health support, drug discovery, and healthcare automation using AI-driven technologies.

³ Interdisciplinary challenges include for example data privacy concerns, regulatory hurdles, integration with existing systems, lack of AI training among healthcare professionals, and ethical considerations in patient care.

well as on the productivity and stability of the whole organization. At the same time, the introduction of new technologies can also create new job opportunities and increase the role of those in society whose knowledge and skills are sufficiently advanced to meet the demands of a changing labour market. More generally, the chapter points out that adapting to technological change will be essential to maintain labour market stability and individual employability. Managing the impact of labour market changes at an appropriate level and supporting workers is key to maintaining productivity in a dynamic economic environment.

5. The necessity of the human workforce behind artificial intelligence

Even though AI and other forms of automation are constantly evolving, it would be far too radical to say that new processes necessarily result in job losses. New technology is bringing changes in the way and type of work. The associations and assumptions that are made about labour being performed solely by robots are wrong, as they do not take into account the human workforce behind AI-powered systems. An example is the case of McDonald's. A video created by the franchise shows a food delivery machine, self-ordering kiosks and empty counters, seemingly showing the unnecessary need for human staff, but it would be inappropriate to speak about full automation. Although direct personal contact between customers and employees can be avoided, staff still have to perform the most important and complex tasks in restaurants, e.g. avoiding cross-contamination (Marx, 2023). Another example is customer service, where companies have been trying to reduce costs for years by switching to automated chat-based correspondence and using robotic assistants (e.g. Vanda at Hungarian Telekom). However, replacing human workers with robots is not feasible, as there are still efficiency problems in answering complex questions and security dilemmas due to the lack of human supervision.

As AI becomes part of our lives, security concerns are also growing, as humans remain a key actor in surveillance. Risks include intentional harm and also failures due to a lack of human oversight. Lack of transparency and explanatory power of AI systems, over-reliance on digital tools, as well as bias, discrimination, high costs and privacy concerns, are also worrying. AI systems can produce distorted results from corrupt data, therefore, the decision-making can be a risk, as the machines are unable to properly assess the consequences of actions (Gülen, 2023). According to Karvalics (2015), the moral responsibility in hybrid systems always belongs to the human component, as machines only operate according to their program. For example, in the healthcare sector, AI can help in making diagnoses, but if used incorrectly, it can lead to misdiagnosis and wrong treatment, in extreme cases, to death (Gülen, 2023).

5.1. Exploiting low-skilled labour in developing countries

Another, but more significant example of the demand for human labour is the use of cheap labour in developing countries in exchange for unfair wages. This activity is typically driven by the lower economic capacity of developing countries and cheap, unskilled labour.

In 2022, an MIT Technology Review study mentioned Tesla as an example of worker exploitation, paying workers in Venezuela an average of 90 cents an hour in exchange for data tagging for the aforementioned self-driving cars. According to MIT Technology Review, self-driving vehicle companies — including Tesla — have taken advantage of the Venezuelan economy by employing local workers in exchange for unfair wages (Hao and Hernandez, 2022). The fact that Tesla's automation would result in fewer workers being involved in the process of data tagging has also been suggested (Marx, 2023). Another example of the use of low-skilled labour is OpenAI's outsourced processes, which are focused on content verification for ChatGPT. In the context of outsourcing, OpenAI has hired Kenyan workers to monitor sensitive ChatGPT content such as murder, suicide, torture, child sexual abuse, or animal cruelty. The activity is aimed at trying to make the AI-driven tool less harmful. The Kenyan workers are required to view a wide range of content, and in compensation, they reportedly received an allowance of less than \$2 per hour. However, to effectively control content, OpenAI aims to detect, regulate and filter content published by AI by integrating security mechanisms. Doing so will contribute to the immediate removal of violent content from the dataset of AI models, which is more efficient and faster than using human labour (Perrigo, 2023).⁴

More tech companies rely on low-skilled workers from developing and less developed countries. Among the Silicon Valley giants, Meta, Microsoft and Google employ low-cost labour for data tagging and content moderation activities in Africa (e.g. Uganda), as well as in the Far East (e.g. India). In addition to unfair compensation and labour exploitation, there are arguments that these companies contribute to job creation and employment improvement in less developed regions (Marx, 2023).⁵

Overall, there is a growing trend towards replacing the human workforce with artificial intelligence, but at this stage, technology companies still rely heavily on human capital. The changes brought by AI will require a highly skilled workforce — given that low-skilled workers, such as those performing data tagging tasks, will eventually be replaced by technology. The question remains open about how quickly economies can respond, the composition of the workforce, skill levels, technology adaptation, and the possibilities for education, training and possible redeployment of the professionals involved in technological processes.

Key findings: In essence, the demand for higher-skilled labour that will result from AI adaptation could further increase inequalities within societies, and also between nations. Overcoming these problems is a complex task, and it cannot be expected

⁴ In order to be more efficient, OpenAI now uses tools such as the Moderation API and Azure OpenAI Service filters to detect and block harmful content. These systems rely on classification models and best practices to ensure safe and responsible AI use (OpenAI, 2025; Microsoft, 2025; OpenAI Community, 2023).

⁵ Meta also outsourced the moderation of content to Kenyan workers through Sama, where moderators monitored harmful content for low wages, leading to mental health problems, including PTSD. In 2023, 185 moderators sued Meta and Sama for 1.6 billion USD, claiming exploitation and inadequate support. The dispute also concerned fair pay, mental health support and fair treatment of social media workers (The Guardian, 2025; Musambi, 2024; Booth, 2024).

that organizations adopting new technologies will use their own resources to solve labour market challenges. Governments have a key role to play in providing training adapted to technological innovation, so that adaptation to a changing environment can be introduced in schools from an early age. The need for new skills and the willingness to learn are essential for training, retraining, redeployment and filling new positions in the sectors most affected, both in the labour demand and in the labour supply.

6. Conclusion

The main conclusion of the research is the positive impact of AI on work processes, the creation of new industries and departments, productivity gains and efficiency improvements, all of which contribute to improving economic performance. The introduction of AI can lead to a cyclical negative effect (e.g. negative labour demand effects or inequalities). Depending on the level of existing technology and the availability of the skills needed to use AI effectively, long-term adaptation by society will be needed. It is not possible to integrate digitalization processes uniformly across sectors, as many areas and generations still require interactions based on personal relationships. AI is effective in data analysis and planning processes, but its effectiveness in issues requiring empathy and human control is still not trusted. In some jobs, human skills remain essential even as AI becomes more widespread. AI is proving to take over some jobs. However, there is more of a shift in processes, as the adaptation of technology and the underlying processes require a significant amount of human capital. It currently does not appear that AI can replace jobs that require sophisticated solutions, but rather support and improve more complex, knowledge-based work. Labour reallocation to more complicated processes and more capital-intensive sectors will generate more relevant labour demand. Consequently, the direct substitution effect of AI is considered to be relatively modest.

The dilemmas discussed in the context of security may lead to the question of whether it is necessary to reevaluate the decisions of AI systems or to accept with full confidence the results they produce. A re-evaluation would require additional professional human resources, while full confidence would lead to excessive bias and the risks mentioned earlier. Therefore, in most sectors, AI systems still tend to perform merely an additional, supporting function.

In several cases, the research findings are based on general observations. However, differences in levels of development among nations, the potential for technological adaptation and sectoral differences all affect the conditions and opportunities for AI adoption and its impact on the labour market and on the economy as a whole (which also depends significantly on government decisions). Different levels of technological development and the high cost of technology do not allow nations to adapt technological innovations equally, which contributes to increasing divergence globally.

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