

ECONOMIC IMPACT OF ARTIFICIAL INTELLIGENCE

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Abstract: Artificial Intelligence (AI) will transform the way we live and work, it raises the questions of how much the technology will impact businesses, clients, the work force and the economy generally. Businesses are interested about AI, in the aspect of how can they capitalize the benefits or the opportunities from using it. In other hand employees are afraid of losing their jobs, since they can be replaced by the newest technologies and robots. AI is not a new field, it started to develop over 70 years in the past by computer scientist. The new term AI, now it refers to the combination of multiple technologies in different industries. Recent concerns on technological unemployment claim that artificial intelligence disrupts the labor market which decreases employment over time. Our paper provides a theoretical explanation in the context of rapid progress of AI and its impact in economy. We incorporated AI as a factor effecting the labour force, which will lead to a decline in employment, by causing job losses, but in other hand having new industries in market. In other hand there will be an increase of productivity and economic growth and the ability of different countries to adapt the process of the transition of the new era of AI.

Keywords: Economic Growth, Artificial Intelligence, labour force, employment

1. INTRODUCTION

The global economy is going through a rapid transformation based on the new technology such as Artificial Intelligence. The impact of AI will be seen more in the process of production, employment or job creation, in the GDP growth.

The potential of AI is to boost the economic productivity by automating tasks, optimizing processes and by enhancing the decision-making process. The automation will reduce the labor cost and at the same time improve efficiency in various industries. The increase of productivity and the creation of huge number of outputs leads to enhancement of economic growth. This means that workers can perform more complex tasks, have more resources of information's needed and help them in the decision making.

Beside the benefits of AI in economics, there are some challenges that must be carefully addressed to. The main thing is that the potential of AI is to automate jobs which leads to displacement and job inequality. A lot of tasks in various industries will be replaced and will require new skills and expertise in different fields.

Government, businesses, and educational institutions must collaborate to develop new strategies for AI adoption. They need to provide trainings and education programs to equip workers with necessary skills, so in that case the effect of job inequality will not be so high.

There are different perceptions about the impact and the effects of AI in economics, some are optimistic such as the saying of Ray Kurzweil that "AI can help us to make major strides in addressing the worker's grand challenge", but in other hand the entrepreneur Elon Musk has warned that "AI could become humanity's biggest existential threat". But the truth is that everything depends on how different countries will manage the transition to the Artificial Intelligence era.

Last but not least, the structure of this study is organized as follows: in the first section called "Introduction", it is highlighted the importance of the topic and the aim of this research, in the second section is literature review where we present the important and recent empirical studies that are conducted on this topic and their findings are discussed, in the third section it is explained the research methodology of this study, the third section explain and interprets the findings of the empirical analysis while the fifth or last part is dedicated to the main conclusions and findings of this research.

2. LITERATURE REVIEW

This section provides theories that the researches used to analyze of the fundamental impact of AI in economy such as, labour productivity, employment, economic growth. Due to the fair of the mass technological unemployment, Brynjolfsson and McAfee (2015) claimed that "AI will put 10 million jobs at high risk, more than were eliminated

by the great recession”. About the fear of impact of AI in employment was also described in the World Development Report 2019 focused on the topic “The changing Nature of Work”. Acemoglu and Restrepo (2020), argued that AI could exacerbate inequality if not carefully managed. They suggest that policies such as universal basic income and progressive taxation could help mitigate the negative impacts of AI on inequality.

Theoretical models from (Solow, 1956) and (Romer, 1986) study the link between innovation and economic growth. Solow mentioned that labor force and capital are exogenously the main drivers of economic growth, hence the usage of Cobb-Douglas production function, which focuses on the interrelation between innovation, output, and productivity. In contrast, Romer's endogenous growth theory considered technological change as a factor of economic growth that is dependent on population growth working in the knowledge sector or R&D and capital accumulation.

Artificial Intelligence can increase the productivity of workers, can replace some jobs and open a lot of other job positions. According to Maitra (2016), human capital investment and employment greatly contribute to increases in economic growth. Also (Korkmaz, 2017), mentioned that capital productivity helps increase the quality of labor through the continuous improvements of different machinery and equipment.

Manyika et al. (2018) study the long-term economic impact of AI, including its potential to transform industries and create new forms of wealth. It argues that AI has the potential to generate significant economic benefits, but that it is important to invest in education and training to prepare workers for the AI-driven economy.

As the implementation of AI progresses it is expected that economic growth will accelerate sharply as an increased improvement cascade through the economy (Nordhaus,2015). Also (Korinek and Stiglitz, 2017), mentioned that AI would complement certain types of labour and replace others, some workers would see their productivity and the wages increase, but some will not, so the net outcome may be faster GDP and productivity growth, but also sharp increases in income and wealth inequality.

3. RESEARCH METHODOLOGY

Considering the main purpose of this research thus, to analyse the relationship between economics and AI, where majority of studies emphasise that AI will have a significant economic impact.

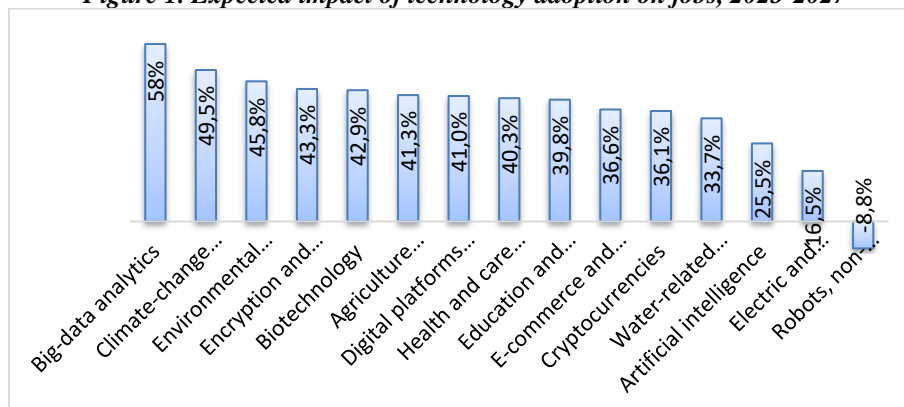
In this regard, the first part is the analysis from “Future of jobs report 2023 – by World Economic Forum, where we will provide a clear picture regarding the adoption of the future trends in technology in different industries. The second part is the evidence from Accenture and Frontier Economics about the economic growth impact of AI, and increases in labour productivity in an AI world, in 12 developed countries.

In the last part we have shown the expected gains from AI in the different regions of the world by 2030, based on data from the PricewaterhouseCoopers (PwC).

4. EMPIRICAL RESULTS

As was already indicated, the main aim of this research study was to investigate the relationship between Artificial Intelligence and Economy. The adoption of the future trends in technology in different industries was emphasised in the “Future of jobs report 2023”, by World Economic Forum, where they made a prediction for the impact of AI in economy in specific areas by 2027.

Figure 1. Expected impact of technology adoption on jobs, 2023-2027

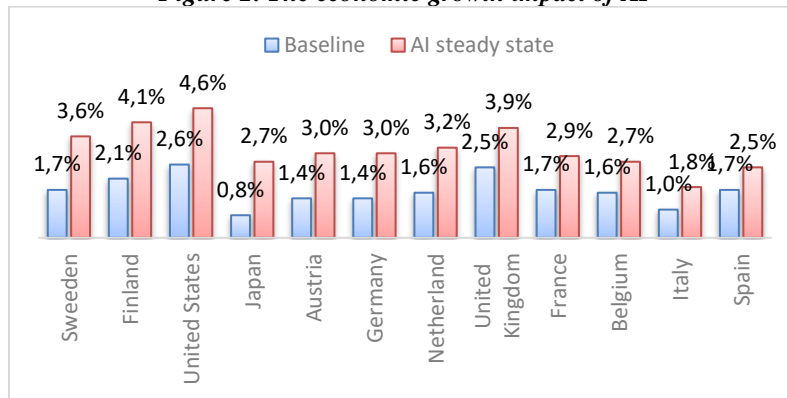


Source: World Economic Forum 2023.

From the (Figure 1) only two technologies are expected to be net job creators in the next five years. Big data analytics, climate change and environmental management technologies, and encryption and cybersecurity are expected to be the biggest drivers of job growth. Agriculture technologies, digital platforms and apps, e-commerce and digital trade, and AI are all expected to result in significant labourmarket disruption. Generative AI has claimed that 19% of the workforce could have over 50% of their tasks automated. Only robots, whether humanoid or non-humanoid, are forecast to have a net negative impact (-8.8%).

According to the research of Accenture and Frontier Economics, with the model GVA impact of AI, results that AI has the potential to double annual economic growth rate up to 2035, for the 12 developed economies, such as below mentioned countries (Figure 2). They have compared two scenarios for each country, one is baseline – expected annual economic growth based on actual circumstances and the second one AI steady state – expected economic growth when AI has been absorbed by the country.

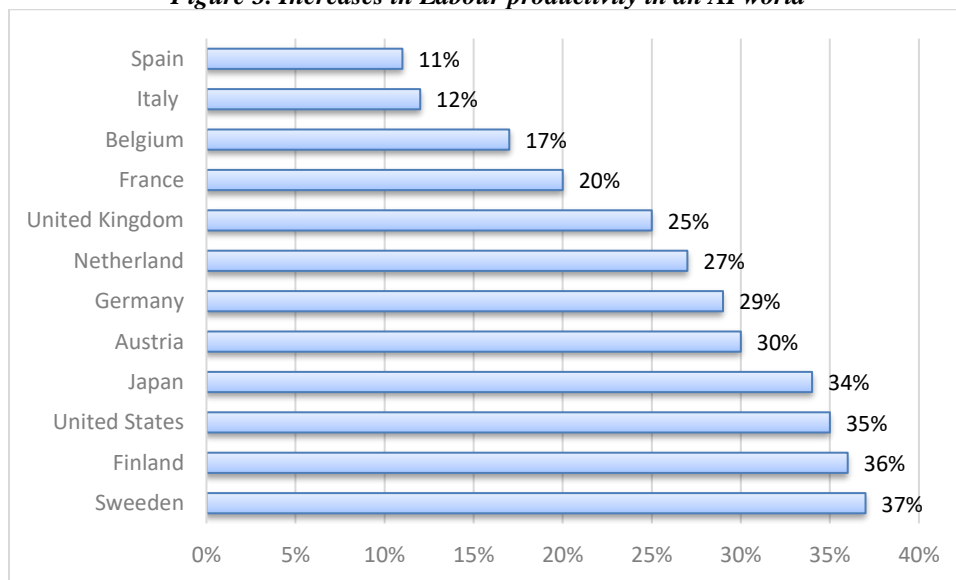
Figure 2. The economic growth impact of AI



Source: Accenture and Frontier Economics

Also, Accenture and Frontier Economics, has made the analysis of increasement of labour productivity with implication of AI in the most developed countries, and the results show that by 2035 there will be a boost of labour productivity up to 40 % (see figure 3.).

Figure 3. Increases in Labour productivity in an AI world



Source: Accenture and Frontier Economics

The results are driven by country’s ability to adopt technological innovation into economic infrastructure. Regards to this, Sweden, Finland, US is having the highest level of adoption of AI in Labour productivity, and less

increase is having Spain and Italy. This rise will not be long working hours, but by people spending their time in more efficient way by using innovative technologies.

A study by PricewaterhouseCoopers (PwC), regarding the expected gains from AI in the different regions of the world by 2030, estimates that global GDP may increase by up to 14 % (the equivalent of US\$15.7 trillion) by 2030 as a result of development and take-up of AI. (See table 1.)

Table 1. Expected gains from AI in the different regions of the world by 2030

REGIONS	% GDP	US \$ TRILLION
North America	14.5%	\$ 3.70
Latin America	5.4%	\$ 0.50
Northern Europe	9.9%	\$ 1.80
Southern Europe	11.5%	\$ 0.70
China	26.0%	\$ 7.00
Developed Asia	10.4%	\$ 0.90
Africa, Oceania & Others	5.6%	\$ 1.20

Source: The macroeconomic impact of artificial intelligence, PwC, 2018

As a result, we can say that the benefits of AI will be felt globally. China is expected to gain most from AI 26% of GDP and US\$ 7.00 trillion, which will occur a huge manufacturing sector. North America is the second one with 14.5% of GDP, US\$ 3.7 (trillion). Europe will also experience significant economic gains from AI, while developing countries are likely to record more modest increases due to lower rates of adoption of AI technologies.

5. CONCLUSIONS

Having into consideration that the impact of AI in the field of economy, is a complex and multifaced issue, we have seen that rapid technology progress in AI has been predicted to lead to unemployment, rising inequality, higher production and higher level of economic growth.

Based on the evidence from theoretical and empirical analyses that researches have done in these recent times, we came to conclusion that AI has the potential to significantly boost productivity, to create new jobs, to close some existing industries and potentially to make job displacement and job inequality. That is the reason that Government and educational institutions must collaborate to provide trainings and to develop strategies that will make easy the adoption of AI, to maximize the positive effects and to make the best use of benefits from it and at the end to mitigate the risks that could appear through the transition process to the new era of AI in the market.

At the end we can say that AI will impact the global economy, since the productivity will be increased due to use of new software's, systems, machineries, which will also boost the consumer demand.

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