

THE ECONOMIC IMPACT OF ARTIFICIAL INTELLIGENCE (AI)

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ABSTRACT

The paper seeks to give an insight and explanation on the workings of Artificial Intelligence and how such technological innovations impact economic structures around the world. Artificial Intelligence is software built to mimic human capabilities of cognition and is being used across industries to increase productivity. Studying the role of AI in human resources, fintech and trading, the article aims to evaluate how it is re-shaping our economies towards positive ends.

Keywords: artificial intelligence, economic growth, fintech, labor forces

I. DEFINITION OF ARTIFICIAL INTELLIGENCE

In order to properly define the term Artificial Intelligence; henceforth referred to as AI, it is important to grasp the meaning of the word intelligence. For the purpose of this piece, intelligence is understood to be the capacity to learn and understand, and to apply this knowledge to achieve a goal or complete a task.

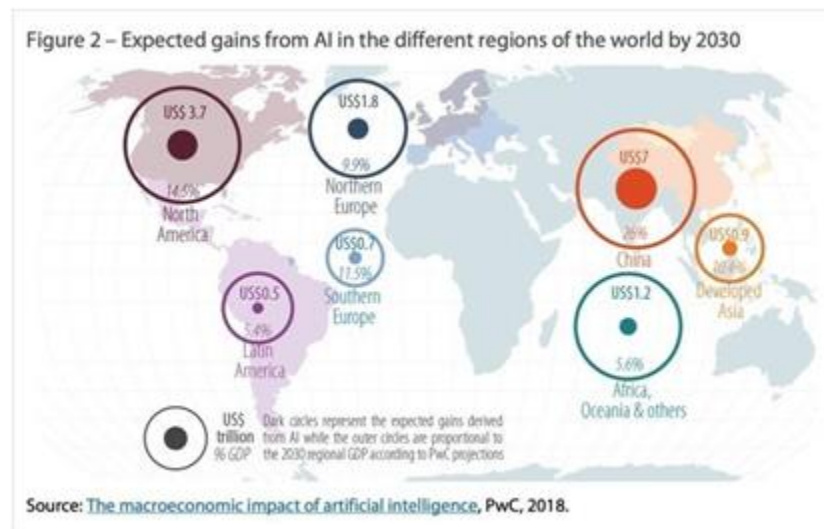
Artificial Intelligence can thus be defined as the use of complex algorithms and software, to emulate the analysis, interpretation, and comprehension of complicated data, therefore performing the human-like cognitive processes of learning and understanding to accomplish a certain task. AI is thereby an extension of human intelligence through the use of computers, as in times past physical power was extended through the use of mechanical tools. It is thus, not a replacement but a mere expansion of human intellect and that is the very reason that this piece maintains that AI has, and will continue to have a positive impact on the economy.

AI is set to transform the way that we live and work, for the better. There is no consensus on whether and to what extent AI related risks will arise; they are not a given, whereas carefully implemented usage can be seen to foster its development and hence that of humankind in the world around us today.

II. ECONOMIC IMPACT OF AI

Research launched by Accenture (Accenture, 2017) covering 12 developed economies which together generate more than 0.5 % of the world's economic output, forecasts that by 2035, AI could double annual global economic growth rates. AI will drive this growth in three important ways.

First, it will lead to a strong increase in labour productivity (by up to 40 %) due to innovative technologies enabling more efficient workforce-related time management. Secondly, AI will create a new virtual workforce – described as ‘intelligent automation’– capable of solving problems and self-learning. Third, the economy will also benefit from the diffusion of innovation in manufacturing, stock markets, fintech firms and create new revenue streams.



Economic gains from AI will be experienced by all sectors of the economy, with each industry expected to see a gain in GDP of at least approximately 10% by 2030. (Gillham, 2017) In order to understand the positive impact of AI on a macroeconomic level, it is essential to delve into areas where AI is or will prominently shape the economy.

1. Impact of AI on Labour forces

A 2016 study by Analysis Group (*Chen N. , Christensen, Gallagher, Mate, & Rafert, 2016*) , considers that AI will have both direct and indirect positive effects on jobs and productivity. AI is likely to improve labour demand and push up the value of human capital in three ways:

First, there is augmentation when an AI system increases the value of the tasks carried out by humans. An example of this would be Amazon's web development and inventory management

tasks: each dollar spent improving its website and stocking many different titles creates a bigger return for the company thanks to its AI recommendation system. This will in general increase the demand for workers whose tasks are augmented.

Second, there is capital deepening. New AI systems are an investment that increases the stock of capital that workers use, making them more productive and increasing demand for labour.

Finally, there is reinstatement, when the AI system creates completely new tasks such as developing machine learning systems or labelling datasets to train those systems. These new tasks will create new jobs and even industries, increasing labour demand.

Considered together, these three channels determine the impact of AI on labour demand. Contrary to the idea of the impending job apocalypse, this model identifies some channels through which AI systems could increase demand for labour.

2. AI in Fintech

Big tech companies such as Google can use their DNA- Data analytics, Network externalities, and interwoven Activities to collect data from their users to reduce information costs. In underdeveloped economies, where borrowers tend to lack basic documentation and collateral to apply for bank loans, this is done to determine credit worthiness of borrowers. Usually, an analysis algorithm is used for the process unlike in conventional banks where, to determine a borrower's credit worthiness, information costs are high. This deters them from providing loans because of the high risk and increased costs.

As seen in China and Africa, the ubiquity of electronic devices and internet connections can actively serve to increase the availability of credit to borrowers and facilitate cashless transactions. In these countries, proprietary payment platforms such as M-Pesa and WePay are immensely popular due to the relative lack of penetration of traditional payment services such as credit cards. Remittance and cross border retail payments, if offered by fintech firms, either without the reliance of an overarching bank or financial institution or in collaboration with them, can serve to promote and stimulate economic activities in nations by providing cross border transfers at relatively low costs. They can especially assist sellers in developing and under developed nations to sell their goods and services to global markets by providing the incentive of low transaction costs and convenient settlement of payments in real time. Fintech firms and institutions that offer this service without the assistance of overarching banks are especially capable of connecting individuals and businesses who don't have bank accounts in their respective under developing and developing countries to other buyers and individuals across the globe, helping them receive and make cross border payments through their proprietary payment

platform.

The use of predictive learning, machine learning, network analysis etc. by fintech firms can help accurately predict the probability of loan defaults by borrowers and can help to reduce the losses incurred by banks and other lending institutions, thereby increasing the confidence of these institutions in the borrower whilst also increasing the scope and availability of credit to individuals and businesses by them.

The predictive power of the big techs' scoring systems arises in large part from exploiting the network structure. For instance, MYbank uses network analysis of transactions to evaluate whether an entrepreneur separates personal funds from business funds. (Shin, 2019).

Adair Morse analysed the impact of fintech AI systems in mortgage lending discrimination, finding that these systems tend to reduce discrimination against Latin and African-American borrowers compared with face-to-face lenders, both in terms of the interest rates charged and the loan approval rates. (Mateos-Garcia, 2020).

Thus, AI can be applied to enhance the functioning of almost every fintech activity.

3. Trading in Financial Markets

AI and machine learning, can enhance delivery and optimize transactional activities for investors accessing the financial markets.

3.1 Discovering Patterns: Incredibly powerful computers are able to crunch almost countless data points in minutes. This means they are also able to detect historical and replicating patterns for smart trading that are often hidden to human investors. Humans simply aren't capable of processing that much data or seeing these patterns at the same rate of technology. Consider that AI can evaluate thousands of stocks in moments. According to CNN, (Egan, 2019) when it comes to high-frequency trading, some hedge funds use AI to decipher as many as 300 million data points on the New York Stock Exchange in the first hour of daily trading alone.

3.2 Predictive Trading Based on Sentiment: By analysing news headlines, social media comments, blogs and more, AI can predict the direction of stocks and the moves of other traders via sentiment analysis — the process of categorizing opinions people have shared in text. (Baluch, 2019).

4. Manufacturing

AI is likely to transform manufacturing into a single cyber-physical system in which digital

technology, internet and production are merged in one.

In the smart factories of the future, production processes would be connected and AI solutions: fundamental in linking the machines, interfaces, and components (using, for example, visual recognition). Large amounts of data would be collected and fed into AI appliances, which would in turn optimise the manufacturing process.

The OECD reckons this use of AI can be 'applied to most industrial activities from optimising multi-machine systems to enhancing industrial research'.

Fundamentally, AI is likely to boost the competitiveness of the manufacturing sector through efficiency and productivity gains enabled by data analysis, and supply chains would be based on these gains. AI would also boost automation, ensure stronger control of products and processes which are likely to be more personalised than ever before, and preventive diagnostics of machinery status, while also ensuring timely maintenance, near-zero downtime, fewer errors and defective products. (OECD, 2017).

iii. Conclusion

Taking into account the positive growth that AI can trigger in the labour force; the various applications it can have in Fintech including but not limited to the availability of credit (even in remote areas), cashless transactions, reduction in discrimination; its ability to optimize trading in financial markets; and its capacity to boost the manufacturing sector by triggering competition, personalisation of products, and so on, it is clear that Artificial Intelligence has, is, and will continue to change the way economies around the world are structured. The very pillars of economies will be revolutionised, helping human beings and firms all around the planet become more financially stable.

To conclude, AI systems can be adopted by any sector facing a prediction problem - which is almost anywhere from the economy to agriculture to finance. This widespread relevance of AI has led some economists to herald it as the latest example of a transformational "General Purpose Technology" that will reshape society like the steam engine or the semiconductor did earlier in history, for the better rather than for the worse.

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