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A Macroeconomic Analysis of the Impact of Artificial Intelligence on Economic Inequality, Workforce Composition, and Economic Growth

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Abstract

Artificial Intelligence's (AI) pervasiveness in the world has caused fear regarding its impact and the future of economies. The AI market size was estimated at about $196.6 billion in 2023. AI has the potential to be a new factor of production. Some believe AI is simply the next phase in the automation process, which has continued for the last 150 years, whereas others believe it could lead to "creative destruction" in the economy. While it could be either, it could also be a combination of both—automation of some jobs while creating new ones that require different skill sets. Nevertheless, it is imperative to ensure a smooth transition of the economy and the workforce into this new phase. This paper analyzes the impact of AI adoption on economic inequality, workforce composition, and output and suggests ways for governments to prepare for potential challenges. It reveals disparities such as those between developing and developed countries, between firms in different industries (telecom & high-tech versus health-care), and between individuals. This paper suggests that nations should secure job growth with higher productivity. The impact of AI is multifaceted, offering opportunities for economic growth but also raising concerns about inequality and workforce composition. Governments must proactively take measures to benefit from AI while trying to minimize its negative externalities.

Keywords

Artificial Intelligence, Economic Inequality, Workforce Composition, Economic Growth, AI Adoption, AI Absorption

1. Introduction

The potential impact of Artificial Intelligence (AI) on macroeconomic factors is

a topic that is currently in the world's spotlight. The AI market size was estimated at about $196.6 billion in 2023 (Grand View Research, 2023a), signifying un-precedented progress. Arguably, AI will be a new factor of production. Despite this, a sense of foreboding is prevalent throughout the world about the probability of a technological singularity as well as including rising concerns about job displacement and labor substitution. The CEO of ChatGPT says he is "incredibly nervous about the existential threat" posed by AI, even as he pursues it. Governments are trying to regulate AI to limit potential negative impacts, while tech giants are investing heavily to capture maximum profits. The rate of absorption/adoption of AI will play a significant role in its impact worldwide. Social acceptance of AI directly impacts its adoption, which has a positive correlation with its impact. Considering this is subjective, future growth trends can be predicted using estimates. Some believe AI is simply the next phase in the automation process, which has continued for the last 150 years, whereas others believe it could lead to "creative destruction" in the economy. While it could be either, it could also be a combination of both—automation of some jobs while creating new ones that require different skill sets. Nevertheless, this raises questions about its macroeconomic impact.

Current literature on the impact of AI includes research papers and studies. Goldman Sachs (2023) estimates that AI could expose about 300 million full-time jobs to automation. Bessen (2018) provides a different view by suggesting that automation often leads to increased employment in the affected industries. Bughin et al. (2018) research offers a thorough review of AI's possible effects on the world economy. They mention the possibility that the deployment of AI could exacerbate economic inequality by bridging inequalities between nations, businesses, and laborers. According to their findings, great powers, especially China and the United States will gain the most from AI. Ernst, Merola and Samaan (2019) delve more into this theme. Brynjolfsson and Unger (2023), explore the macroeconomic implications of AI. They highlight both the potential for significant productivity gains and the challenges in measuring and realizing these gains.

While these studies provide valuable insights into AI's potential macroeconomic impacts, there is a need for more integrated analysis that combines the effects on inequality, workforce composition, and economic growth. Furthermore, although there are various statistics on the projected impact of AI, they have not yet been integrated into a holistic overview. Most existing research focuses on developed economies, which leaves a gap in understanding the specific challenges and opportunities for developing countries. This paper will address these gaps by providing a comprehensive analysis of AI's macro-economic impacts, with a particular focus on the disparities between developed and developing economies, different industry sectors, and various skill levels within the workforce. This paper explores AI's impact on economic inequality, the composition of the workforce and economic output. By analyzing its impact on key

stakeholders—governments, firms, and individuals-this paper aims to explore how AI will reshape the economic landscape. This paper also suggests solutions for governments to implement to counteract the negative externalities raised by AI.

This paper is divided into 5 sections. Section 1 includes an Introduction to the paper. Section 2 includes the Methodology. Section 3 is the Results and Discussion section, which includes 3 sub-sections, each focusing on the impact of AI on a different macro-economic factor. Sub-section 3.1 focuses on Economic Inequality, sub-section 3.2 focuses on Workforce Composition, and sub-section 3.3 focuses on Economic Growth. Section 4 of this paper includes Recommendations to governments. This paper ends with Section 5, which includes the conclusion to the paper, reiterating the key findings, addressing possible limitations and charting a way forward.

2. Methodology

This research paper is an exploratory descriptive study relying on secondary data sources such as websites and reports specifically from reputed sources such as PwC, McKinsey, Accenture, The Economist, etc. The main objective was to explore and describe the potential macroeconomic impact of Artificial Intelligence (AI) across domains. Thematic analysis was used to identify key themes and trends within the collected data regarding the economic impact of AI. The data was then analyzed to understand the potential impact on various sectors. Bar charts and line graphs were used to visualize the extracted information and identify patterns in the data. All sources were evaluated based on various factors such as the date of publication, reputation of the author and the source.

This methodology was chosen because it allowed for a comprehensive examination of the potential macroeconomic impact of AI from a variety of perspectives. By using secondary data sources and thematic analysis, the research was able to identify key trends and potential challenges posed by AI.

There are some limitations to this methodology. Firstly, reliance solely on secondary data and thematic analysis can limit originality of the findings. Secondly, the availability and quality of secondary data on AI's macroeconomic impact varies across sectors and regions, affecting the research's scope. However, to combat this, data was mainly taken from the same sources to ensure uniformity in findings.

3. Results and Discussion

Economic inequality refers to the unequal distribution of wealth and opportunities within different groups in society. Workforce composition relates to what makes up the workforce, including people from different skill sets and demographics. All this correlates to economic output. It is evident that AI will have different scales of impact on all three of these factors. This section aims to devolve deeper to explore and analyse the impact on Economic Inequality, Workforce Composition and Economic Output.

3.1. Impact on Economic Inequality

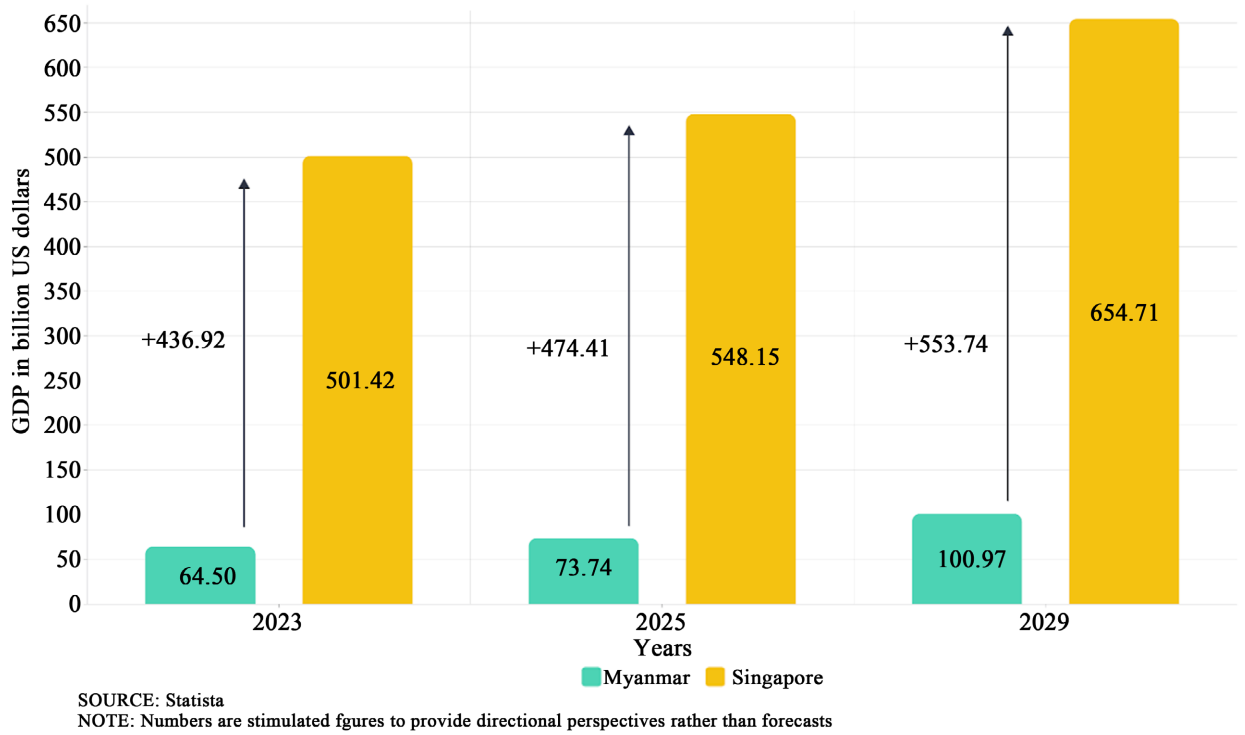
Adopting AI could widen gaps between countries, companies, and workers, causing unparalleled economic inequality. Most developed countries are expected to establish themselves as AI leaders and nationalize it by increasing their adoption as they have adequate funds to do so (The Economist, 2024). Firstly, they need to substitute labor with machines due to slower GDP growth and high wage rates, but this does not imply that they are set to win the AI race. Developing economies can restructure their economy by developing a skilled workforce to improve productivity and strengthen their foundation while being proactive in adoption (Bughin et al., 2018). Though, restructuring itself may pose significant challenges for developing countries. While most breakthroughs have largely been US-led, more countries are starting to emphasize AI initiatives. For example, China—a developing country—aims to become an AI world-leader by 2030 (Mak, 2023). China and the USA are now known as the "Active Global Leaders" of AI as it is estimated that AI will enhance China's GDP by 26.1% and North America's by 14.5% in 2030, equivalent to a total of $10.7 trillion and accounting for almost 70% of the global impact (Rao, Anand, & Gerard Verweij, 2017).

As developing countries have less capacity to develop AI systems, they lose out by not having tax income generated by innovating companies and not having access to patented AI applications (Ernst, Merola, & Samaan, 2019). These would be particularly beneficial for their economic development. Thus, advanced countries may concentrate on innovation in the future, whereas developing economies may be devoted to learning about the new frontier technologies and employing them. This reflects an increasing degree of divergence worldwide. Based on the data in **Figure 1**, the projected GDP growth in developed countries such as Singapore, which are increasingly adopting AI, is significantly higher than that in developing countries such as Myanmar, which have limited adoption. This vast difference reflects the widening economic gap between developed and developing countries as AI adoption progresses. The graph shows that in absolute terms, the economic impact of AI and overall GDP growth is leading to widening in-equality between Myanmar and Singapore. While the relative percentage differences are decreasing, the absolute differences in GDP are increasing, reflecting a growing economic gap in real terms. This absolute growth disparity contributes to widening inequality in terms of economic power, resources, and living standards.

Secondly, there could be a widening gap between companies too. Front runners[1] could double their returns and cash flow by 2030, whereas laggards[2] will fall behind. Over the past three years, the spread in digital and AI maturity between leaders and laggards has increased by 60 percent (Hall et al., 2024). The distance between leaders and laggards is increasing because digital and AI, when implemented well, provide compounding advantages (Hall et al., 2024).

[1]Front runners refer to companies absorbing AI within the next five to seven years.

[2]Laggards refer to companies that are delaying adoption of AI.



SOURCE: Statista
NOTE: Numbers are stimulated fgures to provide directional perspectives rather than forecasts

Figure 1. Economic impact of Al is likely to be much larger in developed economies.

Laggards may also find it difficult to generate impact as AI opportunities would have already been captured by front-runners as competitive dynamics among firms could shift market share from laggards to front-runners. Front-runners would have cumulative advantages as after the fixed costs of development are recovered, they will be able to serve the market at almost zero marginal costs and significant economies of scale (Ernst, Merola, & Samaan, 2019). They also implement AI by investing in technologies that cannot be replicated easily. Thus, the market may become dominated by big firms with highly profitable and privileged positions while limiting competition by strengthening barriers to entry. As laggards will face significant challenges to enter the market, they will have to focus on market niches with less profitable opportunities, producing large inequalities between firms. However, certain laggards may be outliers who choose to adopt or invent certain disruptive technologies, but this has a lower probability. Additionally, laggards can catch up if they're willing to rewire how their companies run (Hall et al., 2024).

Instead of there being only one company controlling the entire industry, it is much more likely that a few big firms will compete against each other, as is the case with industries such as aviation and search engines, as investments in AI are still looking optimistic and big tech firms aim to maximize their profit. Furthermore, it can be expected that most big tech firms would invest in AI due to the fear of "losing out." Evidently, as OpenAI rolled out ChatGPT, their large language model (LLM), Google followed by introducing Gemini. Most AI models have similar computing powers, and code meaning that consumers can

switch easily from one to another. Thus, AI may not establish a monopoly in the market as previously believed, where there is one big tech firm. Rather, the chances of an oligopoly are higher. For instance, OpenAI's Chatbots cost more than $100 m to train. This amount of investment is not plausible for most firms. Training also requires proprietary knowledge and user feedback, which further strengthen the barriers to entry in these industries. In this case, OpenAI would be the front-runner.

Furthermore, for individual workers, demand and wages may grow for those with digital and cognitive skills, and with expertise in hard to automate tasks, but shrink for workers performing repetitive tasks. Therefore, low-skilled jobs may experience the most decline as a share of total employment. This will widen the income gap between high-skilled and low-skilled workers, while intensifying the war for skilled labor and creating an excess labor supply in the market (Lane & Saint-Martin, 2021). Rising demand for workers with high digital skills will result in employment opportunity inequality as well. Thus, technological advancements can lead to skill-biased technical change (SBTC) that favours skilled labour over unskilled labour by increasing its relative demand.

Even though developing countries might struggle to upgrade their education systems to produce AI applications, even with limited resources they can use these applications, with large opportunities for growth potential (Ernst, Merola, & Samaan, 2019). A generic understanding of the uses of new technologies will be necessary, much as reading and basic mathematics skills are required for today's low-skilled workforce. Technological skills will mainly be required in areas where new digital products and services are being developed, which by the nature of this digital industry will remain relatively limited.

AI based models can also have the effect of reinforcing biases and societal stereotypes. For instance, an automated recruiting system which analyzes historical data is likely to replicate the bias that women or ethnic minorities might be ready to accept lower wage offers, as they were experiencing higher entry barriers in the past (Ernst, Merola, & Samaan, 2019). While wage discrimination might, in general, allow expansion of the number of available jobs, as employers are able to offer lower wages to some people who might not otherwise be hired, it is suboptimal in cases where differences in willingness to pay or to accept job offers depend on previous discriminatory practices.

Overall, the inequality between countries (developed and developing), firms (front-runners and laggards), and individuals is expected to increase exponentially. The aforementioned key stakeholders should try to maximize AI adoption to secure their positions in the economy.

3.2. Impact on the Composition of the Workforce

One of the most debated aspects of AI is its potential disruption to the labor market. Concerns abound about widespread job displacement due to automation, leading to un-employment and economic instability. However, AI can also

create new job opportunities and drive economic growth.

According to McKinsey Global Institute, without an acceleration in productivity, there will not be enough workers for countries to meet their GDP growth goals per capita.

Automation could bridge this economic growth gap. Additionally, increased capital investment in AI can create demand for jobs—in existing occupations and new ones—contributing to economic growth (Bughin et al., 2018). For example, between 1980 and 2000 in the United States, about 9 percent of the workforce were employed in job categories that did not exist 15 years earlier. Advances in AI could expose the equivalent of 300 million full-time jobs to automation (Goldman Sachs, 2023). However, AI may not significantly impact net employment in the long term. The labor market has done remarkably well at creating new jobs, even if certain jobs have been lost previously. For example, the advent of the Internet introduced new occupations such as web developers, cybersecurity specialists, etc. Even though new AI technologies are more disruptive and have a larger scale of impact, we can expect a similar outcome.

AI automation also has large positive externalities, which can counteract the negative effects. It can also be related to Joseph Schumpeter's theory of 'creative destruction' based on the principle that new innovations disrupt existing industries, businesses and economies. He also believed that creative destruction was a cyclical process, with periods of disruption followed by periods of stability. Based on this theory, even if AI has a period of disruption in the short-term, it will be followed by stability in the long-term as the economy will adjust. AI is a prime example of creative destruction, leading to the obsolescence of certain industries while creating entirely new ones.

Automation is likely to transform work roles and profiles rather than eliminate employment opportunities completely. In fact, in the past few decades, the average unemployment in countries with the highest rates of automation, such as the G-7 have decreased. Unemployment rates reduced from 7.0% in 1992 to 4.1% in 2022 (The Organization for Economic Cooperation and Development, 2023). Of course, factors other than automation could also play a role in this.

Further, the disappearance of specific jobs depends on whether it is profitable to group certain tasks into specific job profiles and hire workers for these jobs, which relies on demand for the goods and services (Bessen, 2018). AI may redefine existing job profiles, expand human capabilities and increase productivity instead of suppressing a job entirely. On average, 60% of occupations have at least 30% of activities that could theoretically be automated by integrating existing technologies (Parschau, & Hauge, 2020). As machines automate activities, workers can engage in higher-value tasks or tasks that machines can not perform by retraining, up-skilling, and re-entering the workforce (Bughin et al., 2018). Based on the aforementioned findings, AI will definitely eliminate some forms of digital labor, such as transcribing audio from movies. Yet, it will also create demand for other types of digital work. AI relies on data, which can only be pro-

vided by humans. For example, a transcribing audio software would require a dataset of audio recordings and their corresponding transcriptions, provided by humans and even after the algorithm is deployed, humans will be needed to check its functionality and to further improve it. Thus, although there will be disruption brought about by AI in the labor market, it may not be as catastrophic and may be slower-paced than previously believed.

Additionally, AI may increase the demand for labor due to expanded economic activity through innovation in products and services, higher participation in global flows, and productivity gains that may be reinvested in economies. The additional wealth created in the economy creates spillover effects, such as increased consumption, which boosts labor demand (Bughin et al., 2018). According to MGI, online AI-based job platforms could yield 72 million jobs worldwide within the next decade. However, they will also likely increase employment volatility and job insecurity, especially when such newly created jobs are of only temporary nature. A study by America's Bureau of Labour Statistics in 2022 on growth trends for selected occupations considered at risk from automation found that in recent years jobs classified as "at risk" from new technologies "did not exhibit any general tendency toward notably rapid job loss". Historically, it can be seen that job destruction happens at a much slower pace than what is currently believed. The automated telephone switching system—a replacement for human operators—was invented in 1892. It took until 1921 for the Bell System to install their first fully automated office. Even after this milestone, the number of American telephone operators continued to grow, peaking in the mid-20th century at around 350,000. The occupation did not (mostly) disappear until the 1980s, nine decades after automation was invented (The Economist, 2023). Even though AI will take less than 90 years to sweep the labor market as it is much easier to use and adoption is generally higher currently, job destruction through AI will still take time. Here is another recent example: with the advent of LLMs, it is believed that teachers are at the risk of being replaced by AI. While this may be true for certain private institutions, it is improbable that the government will replace teachers with AI in the public sphere. Concerns about public perception and the importance of human interaction in education make a full AI takeover improbable. The same goes for cops.

Eventually, though, governments will need to allow some jobs to be replaced but the delay will allow the economy to produce new jobs, as it always does. About 60% of the jobs in America did not exist in 1940. The job of "fingernail technician" was added to the census in 2000. "Solar photovoltaic electrician" was added five years ago. The AI economy is likely to create new occupations which today cannot even be imagined (The Economist, 2023).

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 et al., 2018). However, some industries will benefit more, depending on their adoption rate. For example, as shown in **Figure 2**, the econom-

ic impact of AI in the telecommunication sector could be 1.16x the impact in the healthcare sector. Surveys show a faster pace of adoption of AI in telecommunications, with over 95% of telecom companies already using it (Infopulse, 2024). In comparison, only around 60% of healthcare organizations have adopted AI (Grand View Research, 2023b). The global AI in telecommunication market size was valued at $1.45 billion in 2022 and expected to grow at a CAGR of 40.4% from 2023 to 2030 (KBV Research, 2023). Thus, its value in 2030 would be approximately $21.2 billion, a 1362.1% increase. In comparison, in 2022, AI in healthcare was valued at $15.4 billion, expected to increase by a CAGR rate of 37.5% from 2023 to 2030 (EdgeDelta, 2024). Thus, its value in 2030 would be approximately $196.76 billion, a 1177.7% increase. While both, the telecom and the healthcare industries are vastly different in their core offerings, they share a need for AI adoption. Both industries generate enormous amounts of data and can use AI to process and analyze this data to extract valuable insights. Both industries need AI to help analyze customer data to tailor products, services, and interactions to individual needs and preferences. AI can automate routine tasks, reduce operational costs, and improve overall efficiency in both sectors. Thus, the pace of adoption and the overall impact of AI on these two industries can be compared as they have similar needs from AI.

In industries with heavy government involvement, such as healthcare, the absence of competitive pressures means that there are less incentives to improve,

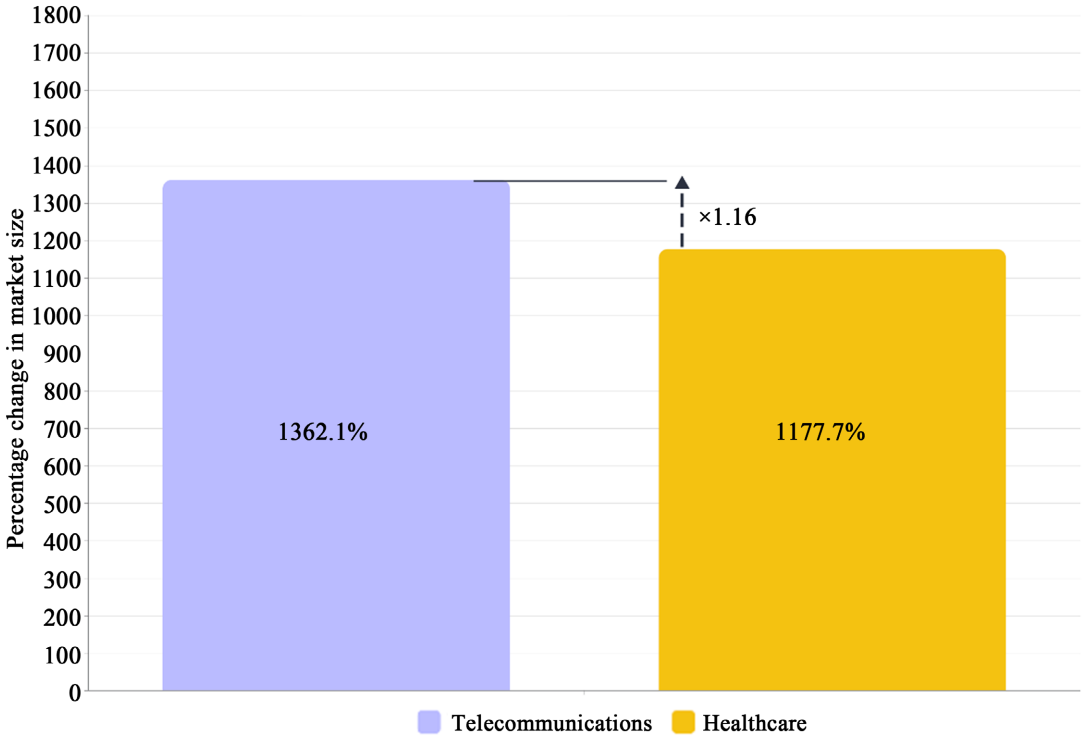


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Figure 2. Economic Impact of Al in different industries.

stagnating technological change. Especially when these sectors are nationalized, governments may have public-policy goals of ensuring maximum employment levels, which contradict improved efficiency.

Even companies operating in the same industry but in different countries might set-up different internal work processes and job profiles, as exemplified currently by the differences between Apple and Samsung in the way they externalize their production chains.

As for productivity, the impact is likely to follow the trajectory of the Solow Paradox, where productivity gains arising from AI may initially cause a dip in the productivity of workers and firms, but then rise exponentially (Bughin et al., 2018). Generative AI could enable labor productivity growth of 0.1 to 0.6 percent annually through 2040, depending on the rate of technology adoption and redeployment of worker time into other activities. Combining generative AI with all other technologies, work automation could add 0.5 to 3.4 percentage points annually to productivity growth (Chui et al., 2023). However, workers will need support in learning new skills, and some will change occupations.

AI could make certain industries more productive. A paper by Erik Brynjolfsson of Stan-ford University and colleagues examining customer-support agents shows that access to an AI tool raises the number of issues resolved each hour by 14% on average. This can be related to the endogenous growth theory that states that economic growth is primarily the result of internal forces, rather than external ones. It argues that improvements in productivity lead to faster innovation and more investments in human capital from governments and private sector institutions. However, this is impossible to validate with empirical evidence.

On the other hand, it is possible that AI makes the economy less productive in general. For example, smartphones and the Internet allow instant communication from anywhere in the world. Yet, they can also be a distraction. A research paper by Microsoft Research in 2016 found that "the longer daily time spent on email, the lower was perceived productivity." (Microsoft Research, 2016). Smartphones and access to the Internet have become widespread in the past decade, yet labor productivity growth rates have been stagnating. In advanced economies, it fell to less than 1 percent, in the 2012-22 decade and in emerging economies, it fell from 5.9 percent to 3.4 percent in the decade to 2022 (Mischke et al., 2024).

Overall, the impact of AI on the composition of the workforce is multifaceted. It may cause the disappearance of some jobs, but it is likely to also replace these with new ones. Workers need to continuously upskill and retrain to ensure their skills match the requirements of the new job market. As for productivity, the gains are likely to be much higher than the potential loss as addressed.

3.3. Impact on Economic Output

The impact of AI on economic output relies on the pace of adoption by firms and its use in innovation rather than labor substitution alone. Generative AI

specifically could deliver an additional economic output of 7% (or almost $7 trillion) increase in global GDP over a 10-year period (Goldman Sachs, 2023). This is because investment in AI innovation can produce additional economic output by expanding firms' portfolios and developing new business models (International Telecommunication Union, 2018).

As shown in **Figure 3**, the net impact and the gross impact of AI on the economy will accelerate in the long run due to the rising adoption and productivity.

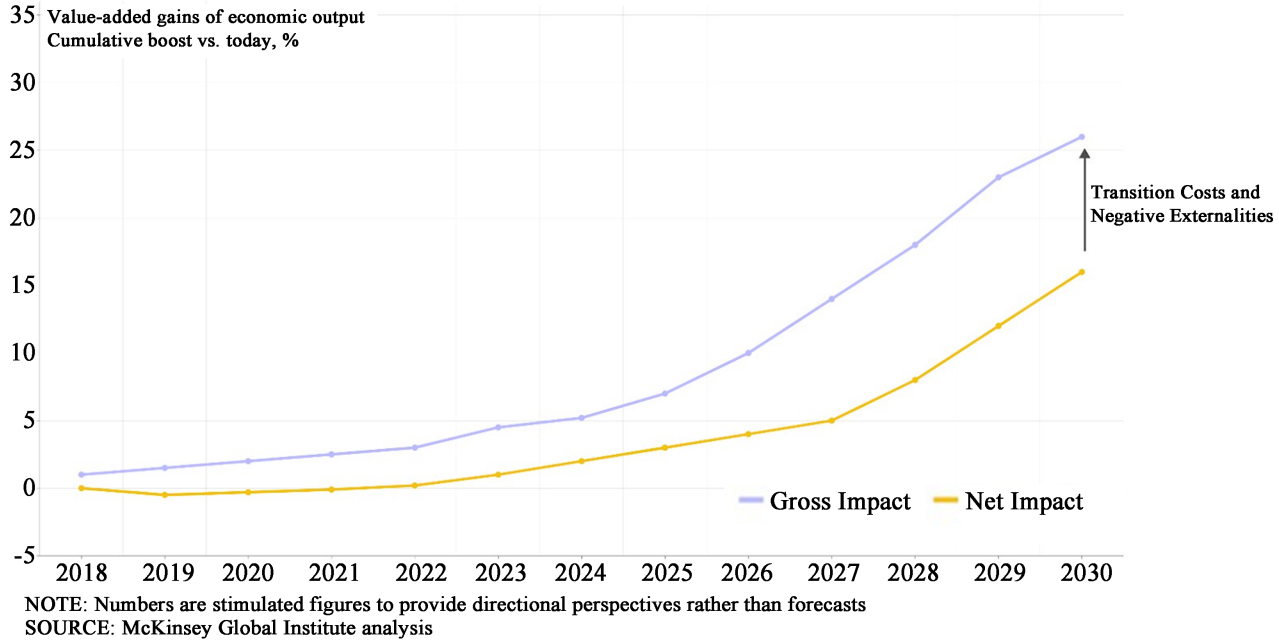

Figure 3. Net and gross impact of Al on economic output.

It is often assumed that AI will have an immense impact on economic growth. However, recent statistics show otherwise. In a recent paper, Goldman's analysts estimate in a best-case scenario generative AI could add about $430bn to annual global enterprise-software revenues. This may seem like a huge number, but in macroeconomic terms, it does cause a huge fluctuation. Assuming all this revenue turns into profits (highly unlikely), and that all of these profits are earned in one country, let's say the USA. In the USA, corporate profits reached $3414.2 billion in Q4 of 2023, while the GDP was $27.94 trillion-corporate profits were 12.22% of its nominal GDP. The addition of revenue from generative AI would make corporate profits 3844.2 bn. Assuming the same GDP, this would mean that corporate profits would now be 13.76% of the GDP. Therefore, the nominal GDP would only rise by 1.54%, which the USA is already achieving. The country in this example is assumed to be the USA since most AI breakthroughs have been here, so it is most plausible that it will have the highest return on investment in AI.

Gains in economic activity arising from increased efficiency and more cross-border commerce can be reinvested to boost economic growth. As workers' in-

comes rise, they spend more, and firms reinvest their profit into operations. The incremental output from higher consumption and more productive investment is re-injected into the economy in the form of higher consumption, more productive investment or jobs growth over time (Bughin et al., 2018). At the macro level, the boost in productivity can lead to greater economic output that is absorbed in the system, creating additional jobs elsewhere, and the overall economy may benefit. Furthermore, advancements in AI are likely to cause long-term economic growth by increasing the production possibility of the economy.

Alternatively, expanded economic activity implies negative externalities from loss of competitiveness in firms that do not adopt AI or displacement of workers who lack technological skills (Bughin et al., 2018). As firms adopt and absorb AI, pressure on employment and wages is likely to increase, which may depress the labor share of income and potential economic growth cyclically through lost consumption—when individuals are unemployed or retraining—and structurally through the relative income effect (Manyika et al., 2017). Historically, this was seen in the Engels' Pause, which describes the stagnation of wage growth in Britain in the first half of the 19th century. Even as output per worker grew, the profit share of national income increased while the labor share of income declined.

The impact of AI on the economy also depends on whether there is sufficient investment to fund new AI companies and research and enable greater corporate investment. Investment in AI is growing rapidly but is still largely concentrated in the United States and China. Private AI investments in the US totaled $335 billion between 2013 and 2023, whereas AI startups in China raised $104 billion over the same timeframe. In comparison, those in the UK raised $22 billion (Lu, 2024). Furthermore, 69 of the top 100 AI startups are based in the USA (Zandt, 2024).

Product enhancements are expected to increase consumer spending by making goods and services more attractive. Increases in both the quality and the variety of goods stimulate demand by making goods relatively more attractive than leisure (the substitution effect). When consumption rises because of increased income and profits, it stimulates dynamic firm entry, which, in turn, increases consumption further through income effects on consumers until the economy reaches its new long-run equilibrium. However, without real incomes rising substantially, these consumption impacts can only have a limited impact on GDP. Therefore, the bulk of the GDP impact comes from dynamic firm entry in response to rising profits. This increased competition and stimulation in supply leads to downward pressure on goods prices, which stimulates demand considerably further as consumers have more disposable income over time to spend on these more attractive goods (The Income Effect) (Gillham et al., 2018).

A key factor when evaluating economic growth is inflation. The impact of AI on inflation is uncertain as on one hand, rising productivity will boost supply, which is disinflationary. However, on the other hand, the notable investments by

firms in AI technologies as well as the higher average incomes will lead to higher consumption and thus, greater inflation. Therefore, the net effect on inflation is based on the timing of these forces as well as firms and households' expectations of the economy and their reactions (Aldasoro et al., 2024).

AI's potential positive contributions to economic growth could offset some of the potential challenges economies may face in the future, including an aging population, changes in global supply chains, and geopolitical tensions.

A key question is whether AI is expected to have permanent growth enhancing effects on GDP or whether it is just a factor that leads to a temporary change in economic growth. Whilst it is true that the shocks from AI to labor productivity and product aspects are permanent, this does not lead to permanent growth rate changes since the impact on growth rates might die out once the shocks have run through the system.

4. Recommendations

To prepare for the micro and macroeconomic challenges brought by AI, governments need to act as AI enablers by:

1) Encouraging AI adoption and overcoming discomfort among citizens about the perceived threat to their jobs. Well-funded tax-benefit systems can help workers cope with transitions to new opportunities in different occupations, sectors or locations (Bughin et al., 2018). This is important due to the changing job profiles. These systems need to include well-maintained digital infrastructure, portability of rights across occupational and geographical boundaries, and a proper incentive and support structure to help workers in successfully undertaking their transition to a new job opportunity.

2) Evolving education systems and learning with a new emphasis on creativity, critical thinking, and adaptive and lifelong learning, so that the future workforce can be adapted to meet the demands of the labour market. Moreover, international coordination on a broad set of competences will be required in order to allow for more labour mobility and better international comparability, which should increase the occupational and geographical mobility of labour.

3) AI regulation needs to be implemented. The action and impact of the General Data Protection Regulation (GDPR) can be analysed to draw inferences for other countries. Moreover, an international set of competencies can be formulated for more labour mobility (Ernst, Merola, & Samaan, 2019). It may also be prudent to have an international governance to regulate AI. Nationally, the government needs to establish a legal framework to regulate AI, such as those enacted by Canada, China, and the UAE.

4) Governments need to adjust anti-trust policies to prevent first movers from establishing market-dominant positions through open-source projects and the development of Creative Commons as an alternative to traditional copyrights. Furthermore, they should keep access to basic AI functions as a public good to maintain a competitive environment and prevent industry concentration. This

hampers private companies from occupying niche areas with large social externalities (such as in the development of new medication). Most importantly, it could allow public technological institutions to co-develop new applications that would help start-ups or other market entrants to compete successfully (Ernst, Merola, & Samaan, 2019).

5) Investing in digital infrastructure to ensure that companies across a broad spectrum of sectors and locations can successfully compete. For emerging economies, this creates new opportunities, as new public infrastructure can be deployed without interference from legacy systems. Certain successful non-AI innovations in electronic payment systems (Mpesa in Kenya) or electric vehicle development (China) can testify to the success of such a strategy.

6) Profit-sharing models can be implemented among companies and countries in advanced economies (e.g., "participation" in France). This proposal might face political resistance, empirical evidence shows it could effectively reduce inequalities while improving company performance (Kurtulus, 2017).

Countries should try to secure the best possible outcome: job growth with higher productivity. To capture these twin benefits, governments need to embrace AI technologies enthusiastically to ensure that productivity gains lead to a virtuous cycle of income growth and higher demand that can create more jobs. Additionally, countries need to try to regulate AI without having very protectionist policies, which would hinder their growth.

5. Conclusion

In conclusion, the impact of AI on economic domains is multifaceted. While the projected impact of AI on economic inequality, workforce composition, and economic output cannot be completely accurate, it is undeniable that AI has the potential to cause both unprecedented progress and disruption. This paper has explored the potential for AI to exacerbate economic inequality between developed and developing countries, companies, and individuals. However, it has also highlighted its potential to create new job opportunities and drive economic growth.

Many of the grandest claims made about AI have failed to become reality. For instance, the flying car. However, we are currently seeing unprecedented progress in the fields of AI, suggesting that our grand claims may not be as far-fetched as once thought. The limitations of this paper lie in the inherent uncertainties of future projections and the reliance on secondary data sources. Another limitation is that the paper has only focused on three aspects of macroeconomics whereas AI adoption could have a significant impact on many more areas.

In the future, key stakeholders-governments, firms, and individuals-should try to minimise the effects of the negative externalities posed by the adoption of AI to gain maximum benefits. Governments can play a crucial role in fostering responsible AI development, promoting reskilling initiatives, and regulating AI

usage.

We do not know what the future might hold in terms of AI, however, it is with certainty that we can say that adoption is a key factor in the impact AI will have on any domain. By embracing AI's potential while acknowledging its challenges, we can navigate this technological revolution and shape a future where AI serves as a tool for inclusive economic prosperity.

Further research is necessary to explore the specific policy frameworks and educational reforms needed to maximise the positive impacts of AI.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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