Journal of Applied Development Economics
Vol. 3, No. 1, 2024, pp. 37-44
ISSN: 2583-214X

https:www.esijournals.comjade

Generative AI Power to Grow Economy: A Study to Measure Generative AI Effects on World Economy

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Article Info

Received: 22 March 2024
Revised: 10 May 2024
Accepted: 28 May 2024
Online: 18 June 2024

To Cite this Papers

Swati Sharma (2024). Generative AI Power to Grow Economy: A Study to Measure Generative AI Effects on World Economy. *Journal of Applied Development Economics*. 3(1): pp. 37-44.

Abstract: Generative artificial intelligence (AI) is a category of AI which is emanate from generation of new content using AI. can construct any type of content by applying generative AI, as it's not only based on the content which are already fed to machine. Economic growth is largely affected by generative AI in both beneficial and gloomy ways. Current demand is to work upon the fact that using generative AI to increase economic growth and decrease/remove negative factors related to it. Ultimately it should work on only increasing economic growth. It explores the effects of AI development on both the transitional dynamics path and the balanced growth path. The advancement of AI has the potential to enhance economic growth during the transitional dynamics path and may boost short-term household utility if AI accumulation stems from increased productivity in the goods or AI sector. Generative AI technologies have emerged as a transformative influence in the content production.

The advancement of AI is expected to lead to the replacement of certain jobs by new AI applications. However, this shift will also give rise to new job opportunities. These roles will not only include expert-level data scientists but also positions like "model supervisors" who will be responsible for training models, evaluating response quality, and managing escalations. This dynamic transformation in the workforce highlights the potential for both disruption and premium service offerings in various sectors as AI continues to reshape industries. However, if AI accumulation is driven by firms substituting human labour with AI, it could negatively impact short-term household utility. Furthermore, the long-term welfare of households may not necessarily benefit from AI development. These findings remain consistent even when considering scenarios where AI enhances human capital accumulation, traditional research and development models, and various forms of physical capital.

Conflict of Interest: As an author I have no conflicts of interest to declare. I am the single author contents of the manuscript and there is no financial interest to report. I certify that the submission is original work and is not under review at any other publication.

Authors Contribution: I am single author contributing to this paper and acknowledging no personal bias or anything with student's views and contribution to the respective subjects.

Funding: It's an individual research paper with no funding.

I. Introduction

Our lives have been suffused by AI with time a lot from technology used in smart T.V. to robotics. Growth of AI always has remained indiscernible as it is expeditious. Self driving cars mesmerized the livelihood in 2018. So it is very clear fact that AI is poignant in economy. Artificial intelligence is becoming increasingly integral to our society and economy, exerting a multifaceted influence on various aspects of our world.

The global competition to harness its advantages is intense, with key players like the US and Asia taking the lead. Many view AI as a catalyst for productivity and economic expansion. It has the potential to enhance operational efficiency significantly and revolutionize decision-making processes through extensive data analysis. Moreover, AI has the capacity to stimulate innovation, leading to the development of novel products, services, markets, and industries, thereby stimulating consumer demand and creating fresh revenue opportunities.

Generative AI, also known as Gen AI, is an artificial intelligence category developed to create original content autonomously, including text, visuals, and music. This innovative technology employs sophisticated algorithms and machine learning models to learn patterns and guidelines from available data, enabling the generation of new content that mirrors the style and structure of the original.

Ada, Knowji, Synthesia, Microsoft Bing, AlphaGo are some generative AI applications which have affected mankind to a large extent. These applications can now handle routine tasks like data organization and classification, but it is their capacity to generate text, compose music, and produce digital art that has attracted significant attention and encouraged experimentation by consumers and households.

Generative AI is an altering science having capability to outstand dramatically and improving the economy. Remarkable profit gains, effectiveness, creativity in many areas are possible using generative AI. Understanding the economic implications of generative AI is crucial for policymakers, businesses, and society as a whole. Generative AI is on the brink of ushering in the next wave of productivity, offering insights into potential business value and workforce impacts. The gradual integration of AI into various aspects of our lives, from smartphone technology to autonomous driving features and retail tools, has been almost imperceptible.

The rapid advancement of generative AI technology poses challenges for stakeholders trying to comprehend its impact on business and society. Similarly,

advancements in generative AI capabilities by companies like Anthropic and Google underscore the dynamic nature of this technology landscape. Understanding the breakthroughs that underpin generative AI's rise is crucial, with foundation models playing a pivotal role in enhancing capabilities across various modalities such as images, video, audio, and code. These models empower AI to undertake diverse tasks like classification, editing, summarization, question-answering, and content creation, showcasing the breadth of possibilities offered by generative AI.

As we embark on this journey to comprehend the potential of generative AI, it becomes evident that this technology has the power to reshape roles and enhance performance in areas like sales, marketing, customer operations, and software development.

Apart from immediate engineering and other specialized roles in data science and development like DataOps and MLOps required for the creation, optimization, deployment, management, and monitoring of machine learning models at scale, the widespread integration of Generative AI technology is expected to generate numerous additional new job opportunities and professions.

The objective of this article is to assess the potential impact of Generative AI technology on business applications, as well as its growing influence on the economy and diverse industry sectors. The discussion also encompasses shortcomings and risks, spanning from technical challenges to legal, security, and privacy concerns. Generative AI technology has recently reached a pivotal moment that is poised to facilitate widespread and swift adoption, potentially heralding a transformative era akin to the next industrial revolution. Numerous indicators point towards the maturity of AI technology having surpassed the tipping point for broad adoption in essential value streams and critical operations.

"This includes increasing the level of productivity through direct efficiency gains as well as accelerating the rate of innovation and future productivity growth," Korinek says.

II. Objective

Businesses encounter various challenges when implementing generative AI technologies, such as dealing with technical intricacies, integrating with legacy systems, mitigating technical debt, addressing algorithmic bias, and ensuring effective coordination and oversight.

These hurdles arise from the complexity of generative AI models, the need for a shift in mindset, the risks associated with technical debt, the potential for

biased outcomes, and the importance of establishing centres of excellence to govern the use of generative AI efficiently. Employers face obstacles in comprehending risks, managing data, developing practical applications, engaging with regulatory bodies, and recruiting or up skilling talent for the adoption of generative AI.

Despite the significant transformative potential of generative AI, slow adoption rates persist due to uncertainties surrounding AI, concerns about workforce implications, and regulatory challenges. Companies are advised to prioritize equipping their workforce with the requisite skills to effectively leverage generative AI. In the realm of higher education, the integration of generative AI necessitates the development of policies, cross-functional collaboration, adherence to ethical principles, risk assessments, and partnerships with other educational institutions.

Challenges include managing costs, securing funding, fostering experimentation, leveraging educational opportunities, ensuring ethical considerations, and promoting responsible AI integration within academic environments. The emphasis lies on striking a balance between innovation and digital literacy, fostering a culture of critical thinking, and establishing partnerships to align AI initiatives with educational values and objectives.

However Generative AI, a cutting-edge technology, presents both advantages and challenges that need to be carefully considered. It has the potential to revolutionize industries, enhance creativity, and optimize processes, but it also requires vigilance to mitigate risks such as biased outputs, legal implications, and ethical considerations. As this technology continues to evolve, balancing its benefits with these challenges will be crucial for its responsible integration into various sectors.

Enhanced creativity, data generation and interpretation, cost optimization, content creation and personalization are the major pros of using generative AI for economic growth. But ensuring quality and accuracy, legal issues, ethical considerations

III. Major Practical Uses of Generative AI

Finance

Within the financial sector, AI algorithms are utilized for fraud detection and investment opportunity identification. Generative AI has demonstrated its capability to automate mundane tasks, improve risk management, and streamline financial processes. Generative AI aligns well with finance due to its proficiency

in handling extensive datasets, a fundamental requirement for the sector's operations to thrive.

Trading

Enhancing inventory control and suggesting products to customers according to their buying patterns and online activity represents just a fraction of the benefits Generative AI offers the retail sector. Generative AI can further assist retailers in boosting sales and streamlining operations. For instance, Generative AI can support retailers in managing inventory and enhancing customer service, addressing key cost considerations for store operators. Additionally, Generative AI can aid retailers in fostering innovation, cutting expenses, and concentrating on the creation of novel products and systems.

Entertainment

Within the entertainment sector, Generative AI tailors personalized suggestions for films, series, and music according to individual tastes. This innovation offers comparable efficiency and precision as seen in other industries, presenting a cost-effective solution for media enterprises. Conversely, the capacity of Generative AI to supplant tasks traditionally performed by human writers, artists, photographers.

Medical

In the healthcare sector, Generative AI is employed for analyzing medical images and aiding physicians in making diagnoses. As per a World Health Organization (WHO) report, administrative errors account for up to 50% of all medical mistakes in primary care. Generative AI has the potential to enhance precision, yet its reliability is contingent on the calibre of training datasets, as highlighted by the World Economic Forum. Moreover, the WHO foresees a deficit of 10 million healthcare professionals by 2030. Generative AI is projected to mitigate this shortfall by enhancing efficiency, enabling fewer workers to cater to a larger number of patients.

Transportation

Within the transportation sector, self-driving vehicles leverage Generative AI to manoeuvre roads and make instantaneous decisions. However, the scope of Generative AI applications in transportation extends far beyond this. Artificial intelligence can address challenges beyond human capabilities, such as traffic

congestion, limited parking spaces, and lengthy commutes. Generative AI is anticipated to contribute to enhancing the quality, safety, efficiency, and sustainability of forthcoming transportation systems that are currently nonexistent.

Manufacturing

Generative AI holds the potential to transform the manufacturing industry. By harnessing extensive data and forecasting results, AI has the capacity to revolutionize decision-making, streamline production processes, elevate product standards, and minimize inefficiencies. In manufacturing, Generative AI is enhancing operational efficiency and enforcing adherence to protocols. Additionally, it can boost performance transparency throughout various business divisions by amalgamating diverse data origins.

Some organizations using generative AI

Numerous companies are embracing generative AI for both consumer-facing and internal applications due to its innovative uses and potential business advantages. Some prominent examples include:

- **Tesla (TSLA)** utilizes generative AI in its self driving vehicles for real time decision making and navigation using AI-powered sensors and algorithms.
- **Netflix (NFLX)** leverages generative AI in its recommendation engine to suggest content based on user preferences.
- **Microsoft** incorporates generative AI in its Azure cloud computing platform and Bing search engine.

IV. Potential risks and improper applications of Generative AI and its impact on the economy

Generative AI technology has the capability to create powerful tools with significant potential for aiding in harmful activities if misapplied. Currently, all well-known mainstream models are supported by organizations that prioritize safeguarding their reputation by ensuring their creations are not easily exploited for criminal or terrorist purposes. Essentially, the use of "troll farms" in disinformation and influence operations can be readily replaced by Generative AI technology.

Ensuring the quality of outputs from generative AI models is complex due to their unpredictable nature. This unpredictability can lead to the generation

of inappropriate or offensive content, particularly when cultural nuances are overlooked. Generative AI models may encounter challenges in dynamic environments where current knowledge is crucial, as the training data tends to be skewed towards older and potentially outdated information.

Consequently, these systems may increasingly rely on self-generated input rather than fresh human-created content. When training data is flawed, such as containing hallucinations or biases, the generated output may become more constrained, less dependable, and less representative of reality.

Generative AI models are prone to producing biased outputs influenced by the biases present in the training data. This can result in the creation of unfair or discriminatory content. The advanced capabilities of generative AI make it susceptible to misuse enabling users to exploit the technology for unintended purposes, such as generating inappropriate responses or exposing confidential information.

Generative AI introduces legal and regulatory risks, including instances where copyrighted material is used without authorization. The lack of transparency in training data and potential privacy issues can also lead to legal consequences. It models trained on datasets containing personal information may inadvertently reveal sensitive data, leading to privacy breaches and breaches of trust. It has the potential to magnify existing biases present in the training data, perpetuating discrimination and unfairness in the generated content.

It has the potential to heighten the risk of fraud, economic crimes, and organized crime. It empowers cybercriminals to craft more sophisticated phishing emails that are grammatically accurate and convincing, along with producing more realistic audio, visual, and video content. Accountants are advised to educate their staff about this emerging threat and maintain a high level of scrutiny when assessing the authenticity of communications, documents, and evidence.

These limitations underscore the importance of carefully considering the ethical implications and potential risks associated with utilizing Generative AI technology to mitigate harm and ensure responsible deployment.

V. Risk Mitigation

Methods like reviewing training data, implementing effective prompt engineering, considering ethical implications, practicing professional skepticism, and exercising critical judgment can all aid in mitigating risks, as elaborated further in the subsequent sections.

As generative AI models and functionalities become integrated into a broader array of products and services, organizations may need to oversee significant change initiatives. Technological and data strategies might require adaptation. Governance frameworks, policies, and controls will necessitate regular assessment to ensure they are sufficiently robust in identifying and addressing potential risks.

While generative AI introduces unique challenges, some risks align with those posed by other AI technologies, and standards like ISO/IEC 23894 – a novel standard for AI risk management – can offer guidance on mitigating such risks.

VI. REVIEW OF LITERATURE

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