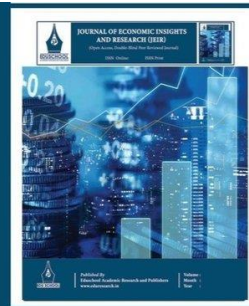


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Impact of Artificial Intelligence on the Global Economy

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Abstract

Artificial Intelligence (AI) has emerged as one of the most influential technological innovations of the twenty-first century, significantly transforming economic systems, industrial structures, labor markets, and global trade mechanisms. The rapid development of machine learning, robotics, natural language processing, predictive analytics, and generative AI technologies has accelerated digital transformation across the world. This research paper critically examines the impact of Artificial Intelligence on the global economy by analyzing its role in economic growth, industrial productivity, employment generation, international trade, innovation, and income inequality. The study is based on secondary data collected from reports of international organizations such as the International Monetary Fund (IMF), Organisation for Economic Co-operation and Development (OECD), World Economic Forum (WEF), Stanford AI Index Report, and peer-reviewed research articles published between 2024 and 2026. The study reveals that AI has become a major contributor to economic expansion by increasing efficiency, reducing operational costs, improving decision-making processes, and enabling automation across industries. Advanced economies such as the United States, China, Japan, and European countries are investing heavily in AI infrastructure and research to strengthen their competitive position in global markets. Simultaneously, AI has created challenges related to employment displacement, ethical concerns, cybersecurity risks, and widening economic inequality between technologically advanced and developing nations. The paper also discusses sector-wise impacts of AI in manufacturing, healthcare, banking, agriculture, education, and logistics. The findings suggest that although AI offers significant opportunities for economic development and innovation, its benefits remain unevenly distributed due to disparities in digital infrastructure, investment capacity, and technological preparedness. Therefore, governments and policymakers must formulate inclusive strategies focusing on education, workforce reskilling, ethical governance, cybersecurity, and sustainable digital development. The study concludes that Artificial Intelligence will continue to reshape the future of the global economy and that nations that effectively integrate AI technologies into their economic systems will emerge as leaders in the evolving digital era.

Keywords: - Artificial Intelligence, Global Economy, Automation, Economic Growth, Productivity, Employment, Innovation, Digital Transformation.

I. INTRODUCTION

AI systems enable computers and machines to perform tasks traditionally associated with human intelligence, including learning, reasoning, decision-making, language understanding, and problem-solving. Over the past decade, AI technologies have evolved rapidly and become integrated into numerous sectors of the global economy. Businesses, governments, and institutions worldwide are increasingly utilizing AI systems to improve efficiency, automate operations, and generate innovative solutions to complex economic and social problems.

The global economy has experienced major technological transformations throughout history, including the Industrial Revolution, the rise of computers, and the development of the internet. However, the emergence of AI represents a new phase of digital transformation with far-reaching economic implications. AI technologies are now capable of analyzing vast quantities

of data, predicting consumer behavior, optimizing industrial production, and automating tasks previously performed by humans.

The economic significance of AI has increased substantially due to advancements in machine learning and generative AI systems. AI-driven tools are being used in sectors such as healthcare, banking, education, transportation, manufacturing, retail, and agriculture. Governments are investing heavily in AI research and infrastructure to strengthen economic competitiveness and national development strategies.

According to the IMF, AI has the potential to significantly increase global productivity and contribute to long-term economic growth (International Monetary Fund [IMF], 2025b). However, concerns regarding job displacement, ethical governance, cybersecurity, and widening inequality have also emerged as major global challenges associated with AI adoption.

The purpose of this research paper is to analyze the impact of AI on the global economy by examining its effects on economic growth, industrial productivity, labor markets, international trade, and income distribution. The paper further evaluates the opportunities and risks associated with AI-driven economic transformation and suggests policy recommendations for sustainable and inclusive development.

II. OBJECTIVES OF THE STUDY

The major objectives of the present study are as follows:

- To examine the impact of AI on global economic growth.
- To analyze the role of AI in improving industrial productivity and innovation.
- To study the influence of AI on employment and labor markets.
- To evaluate the impact of AI on international trade and economic competitiveness.
- To identify challenges associated with AI-driven economic transformation.
- To suggest policy measures for inclusive and sustainable AI development.

III. RESEARCH METHODOLOGY

The present study is descriptive and analytical in nature. The research is entirely based on secondary data collected from reliable and authentic sources such as international reports, scholarly journals, institutional publications, and research databases.

The major sources used in the study include reports published by the IMF, OECD, WEF, Stanford AI Index Report, and various peer-reviewed academic articles published between 2024 and 2026.

The collected information has been systematically analyzed to understand the economic implications of AI on global industries, employment structures, productivity systems, and international trade. Qualitative analysis has been employed to interpret economic trends and policy developments related to AI technologies.

IV. CONCEPT OF ARTIFICIAL INTELLIGENCE

AI is a branch of computer science that focuses on developing systems capable of simulating human intelligence. AI systems are designed to process information, recognize patterns, learn from experience, and make decisions with minimal human intervention.

The major categories of AI include machine learning, deep learning, natural language processing, robotics, computer vision, expert systems, and generative AI. Machine learning enables systems to improve performance through data analysis, while deep learning uses neural networks to process complex information and identify hidden patterns.

Generative AI has emerged as one of the most transformative forms of AI in recent years. These systems can generate text, images, software code, videos, and analytical content. The increasing accessibility of generative AI tools has accelerated digital innovation and transformed the operational structures of businesses and institutions globally.

AI relies heavily on data, algorithms, and computing power. Organizations with access to large datasets and advanced computing infrastructure possess a significant competitive advantage in AI development and implementation. Consequently, AI has become a strategic priority for governments and multinational corporations worldwide.

V. IMPACT OF AI ON GLOBAL ECONOMIC GROWTH

Recent advances in machine learning have become a major driver of global economic growth by increasing efficiency, reducing operational costs, and improving productivity across industries. AI technologies enable businesses to automate repetitive tasks, optimize workflows, and enhance decision-making capabilities (Anthropic, 2025).

The IMF reported that AI could significantly increase global GDP over the coming decades (Gondauri, 2025; IMF, 2025c). AI-driven automation and predictive analytics allow firms to produce goods and services more efficiently, thereby contributing to higher economic output.

Countries such as the United States and China invest heavily in AI research, semiconductor manufacturing, cloud computing infrastructure, and data systems (Stanford Human-Centered Artificial Intelligence [Stanford HAI], 2025). These investments strengthen their positions as global economic and technological leaders.

AI contributes to economic growth in multiple ways. First, automation reduces dependence on manual labor in repetitive activities, thereby lowering production costs. Second, AI promotes innovation by enabling the development of new products, digital services, and business models. Third, AI improves data analysis and forecasting capabilities, allowing firms to make informed strategic decisions.

The rise of AI-based startups contributes to economic diversification. Sectors such as fintech, health technology, cybersecurity, logistics, and e-commerce are experiencing rapid growth due to AI-driven innovation (Stanford HAI, 2025). As a result, AI has become a central component of modern economic development strategies worldwide.

VI. IMPACT OF AI ON EMPLOYMENT AND LABOR MARKETS

One of the most widely debated aspects of AI is its impact on employment and labor markets. AI-driven automation has transformed the nature of work by replacing routine and repetitive tasks with intelligent systems and machines.

Historically, technological revolutions displaced some jobs while creating new employment opportunities. Similarly, AI reshapes labor markets rather than completely eliminating human employment. AI systems are increasingly being used for tasks such as customer service, bookkeeping, manufacturing operations, and administrative processing.

Low-skilled workers engaged in repetitive occupations face higher risks of job displacement due to automation (Anthropic, 2025).. At the same time, AI has created new employment opportunities in fields such as data science, machine learning, robotics, cloud computing, cybersecurity, and software development.

The growing demand for AI-related skills increases the importance of technical education and workforce reskilling programs. Governments and educational institutions increasingly focus on digital literacy and skill development initiatives.

However, AI may increase income inequality because highly skilled professionals benefit more from technological transformation than low-skilled workers (Cerutti et al., 2025) . The wage gap between technologically skilled employees and routine labor workers is likely to widen further in the coming years.

Developed economies possess stronger educational systems and digital infrastructure, enabling workers to adapt more effectively to technological change. In contrast, developing countries may struggle due to limited technological preparedness and inadequate investment in education and digital systems.

VII. AI AND INDUSTRIAL PRODUCTIVITY

Rapid digitalization has significantly improved industrial productivity by automating production systems, optimizing resource utilization, and minimizing operational inefficiencies (IMF, 2025b). AI-powered technologies are transforming manufacturing industries through smart factories, robotics, and predictive maintenance systems.

Manufacturing companies are increasingly adopting AI-driven automation to improve production speed, reduce human errors, and enhance product quality. Predictive maintenance systems use AI algorithms to identify potential equipment failures before they occur, thereby reducing downtime and operational losses.

In the banking and finance sector, AI is widely used for fraud detection, algorithmic trading, customer relationship management, and risk assessment (Organisation for Economic Co-operation and Development [OECD], 2025). AI-powered chatbots and virtual assistants have improved customer service efficiency while reducing operational expenses.

Healthcare systems worldwide utilize AI technologies for disease diagnosis, medical imaging, drug discovery, and personalized treatment planning. AI applications improve healthcare efficiency and reduce costs associated with manual processes (Stanford HAI, 2025).

Transportation and logistics industries experience substantial productivity gains through AI-enabled route optimization, warehouse automation, and intelligent supply chain management systems.

Overall, AI-driven productivity improvements are enhancing economic efficiency and strengthening global industrial competitiveness.

VIII. AI AND INTERNATIONAL TRADE

AI significantly transforms international trade by improving logistics systems, reducing transaction costs, and enhancing supply chain management. AI-powered technologies allow businesses to forecast demand, optimize inventory management, and improve transportation efficiency (World Economic Forum [WEF], 2025).

Digital commerce platforms utilizing AI expand global market access for businesses of all sizes. AI-based recommendation systems, automated customer support services, and personalized marketing strategies have increased the efficiency of international e-commerce operations.

Countries investing heavily in AI technologies gain competitive advantages in global trade through higher productivity and technological capability (WEF, 2025). AI also increases the importance of digital trade and cross-border data flows in the global economy.

However, AI-driven transformation may widen the technological gap between developed and developing nations (Cerutti et al., 2025). Countries lacking digital infrastructure and technological capabilities may struggle to compete in increasingly automated global markets.

Therefore, international cooperation and technology-sharing initiatives are essential to ensure inclusive participation in the AI-driven global economy.

IX. CHALLENGES ASSOCIATED WITH AI

Despite its numerous economic benefits, AI presents several social, ethical, and economic challenges.

One of the major concerns is job displacement caused by automation. Workers engaged in repetitive and routine occupations are particularly vulnerable to unemployment due to AI adoption.

Ethical concerns related to algorithmic bias, transparency, accountability, and decision-making fairness also remain significant challenges (OECD, 2025). AI systems may produce biased outcomes if trained on inaccurate or discriminatory datasets.

Cybersecurity risks associated with AI technologies are increasing rapidly. AI systems can potentially be exploited for cyberattacks, financial fraud, misinformation campaigns, and data manipulation.

Another major challenge is data privacy. AI systems require large quantities of personal and institutional data, raising concerns regarding surveillance and misuse of sensitive information (Stanford HAI, 2025).

Additionally, AI infrastructure requires substantial computing power and energy consumption, creating environmental and sustainability concerns (IMF, 2025a).

X. POLICY RECOMMENDATIONS

Governments and policymakers must formulate comprehensive strategies to maximize the benefits of AI while minimizing associated risks (Reuters, 2025).

The following policy measures are recommended:

- Investment in digital infrastructure and internet accessibility.
- Promotion of AI education, technical training, and workforce reskilling.
- Development of ethical and transparent AI governance frameworks.
- Strengthening cybersecurity and data protection regulations.
- Encouragement of international cooperation on AI standards and policies.
- Support for AI research and innovation in developing economies.
- Promotion of sustainable energy solutions for AI infrastructure.

XI. CONCLUSION

AI has emerged as one of the most transformative technologies influencing the modern global economy. AI-driven systems are revolutionizing industries, increasing productivity, accelerating innovation, and reshaping labor markets across the world. The study reveals that AI possesses substantial potential to contribute to global economic growth and industrial modernization. However, the benefits of AI remain unevenly distributed due to disparities in technological infrastructure, educational systems, and investment capabilities. AI-driven automation may create employment opportunities in emerging sectors while simultaneously displacing workers engaged in routine occupations. Consequently, governments and institutions must prioritize workforce reskilling, digital literacy, and inclusive technological policies. The research further demonstrates that ethical governance, cybersecurity protection, and sustainable development strategies are essential for ensuring responsible AI implementation.

In conclusion, AI will continue to shape the future trajectory of the global economy and influence patterns of productivity, trade, and labor transformation. While significant progress has been made in understanding its economic implications, further research is needed to examine long-term effects on employment structures, inequality, regulatory frameworks, and cross-country disparities in AI adoption. Future studies may also explore how emerging AI technologies can support sustainable and inclusive economic development.

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