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SECTORAL VULNERABILITY AND ADAPTATION: MAPPING ARTIFICIAL INTELLIGENCE'S VARIABLE IMPACTS ACROSS KEY U.S. ECONOMIC SECTORS

Linda Zoe Serh[a], Nunana Klenam Djokoto [b]
[a] *Department of Sociology, University of Ghana, Ghana*
[b] *Department of Political Science, University of Ghana, Ghana*
**Corresponding Author: Nunana Klenam Djokoto*

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ABSTRACT

AI is transforming the U.S. economy, innovating across healthcare, manufacturing, finance, and agriculture, and posing special challenges. This literature review summarizes peer-reviewed published papers to study the consequences of AI and adaptation methods in these areas. Healthcare is the area that can benefit greatly because of accurate diagnostics, and it also has the problem of privacy and fairness. Manufacturing becomes efficient, but at the risk of the displacement of jobs. Finance increases fraud detection against cybersecurity threats. Agriculture enhances production amid the connectivity constraints. The review also finds weaknesses, including biased algorithms, labor shifts, and infrastructure deficiencies, and recommends specific initiatives, including re-skilling, regulatory revision, and community outreach and engagement, to ensure AI is incorporated fairly. By outlining the various impacts that AI has, this study will equip policymakers and industry leaders with evidence-based information to lead to sustainable economic growth and the trust that society has in it. The results highlight the importance of tailored policies to strike a balance between innovation and stability to ensure that AI can make the U.S. economy even stronger while addressing ethical and social issues.

KEYWORDS: *Artificial Intelligence, Sectoral Impacts, Economic Adaptation, U.S. Economy, Societal Trust*

1. INTRODUCTION

Artificial intelligence (AI) is revolutionizing the American economy, and the forecasts are that AI will contribute between 3.5 and 5.8 trillion dollars to gross domestic product by the year 2030 (Bughin et al., 2018). Its impact reaches areas of healthcare, manufacturing, finance, and agriculture, which present different opportunities and drawbacks due to the nature of technological infrastructure, workforce potential, and regulation (Brynjolfsson et al., 2019). Healthcare uses AI to make precise diagnoses, but the field faces several ethical dilemmas, including patient confidentiality and fairness of algorithms. Manufacturing enjoys the benefits of efficiency, but there is the risk of loss of jobs, especially among the low-skill workers. Finance optimizes processes by detecting fraud, yet it faces cybersecurity weak points. Agriculture is contributing to productivity through precision farming, and the barrier to the scalability of the connection. The perception of the population is also paramount, as 45 to 50 % of Americans will be skeptical about the use of AI in making decisions in 2024, affecting the rate of adoption (Pew Research Center, 2024). Such differences require industry-specific approaches to ensure AI capabilities are realized to the fullest, and weaknesses are mitigated. The systematic literature review examines the works dated between 2015 and 2025 to chart the economy, technological risks, and adaptation strategies in these sectors. By compiling the evidence, the review will inform policymakers and industry leaders to facilitate policies that will facilitate sustainable integration of AI, in a way that is equitable, and build economic resilience and societal confidence across the U.S.

2. LITERATURE REVIEW

2.1 Healthcare: Diagnostic Precision and Ethical Concerns

Artificial intelligence can improve healthcare diagnostics and reach 96 % accuracy in identifying lung cancer based on imaging data, which is better than the traditional method (Ardila et al., 2019). The use of AI-enabled medical devices is quickly becoming accepted as the number of devices cleared by the Food and Drug Administration in 2023 increased to 223 as compared to six in 2015 (Stanford HAI, 2025). But biased algorithms fail to diagnose minority

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groups, and one in six models are biased in the year 2024, destroying trust in the care delivery system (Obermeyer et al., 2019; Topol, 2024). There are still some issues in terms of privacy, with the Health Insurance Portability and Accountability Act not being able to cover all aspects of AI data security (Price & Cohen, 2019). Population skepticism, half of the American population is afraid of AI in healthcare, is a problem to progress (Pew Research Center, 2024). To overcome these problems, transparent AI systems and clinician training on bias mitigation are also suggested, as well as the involvement of the population in the process of gaining confidence in the use of AI (He et al., 2019; Cohen et al., 2020). These guidelines are meant to provide fair and credible medical innovations.

2.2 Manufacturing: Efficiency Gains and Workforce Shifts

Automation based on AI enhances the efficiency of manufacturing processes, and predictive maintenance can save 25 % of manufacturing costs in U.S. factories (Chui et al., 2018). By 2030, AI will boost efficiency by 15 to 30 % making the world more competitive (Joshi, 2025). Nevertheless, there is a threat of automation of 20 to 30 % of low-skill jobs, and 40 % of workers are reported to be experiencing job insecurity in 2024 (Frey & Osborne, 2017; U.S. Bureau of Labor Statistics, 2024). As an example, Boeing trained 10,000 employees by 2023 to work with AI-integrated systems, which is a proactive adaptation (Wilson et al., 2019). The collaboration of the state and the business sector is necessary to make training relevant to the needs of the industry and help workers adjust to the changes in technology (Acemoglu & Restrepo, 2020). The way people perceive it is a problem, as 48 % of the workers are doubtful about the effect of AI (Pew Research Center, 2024). Reskilling initiatives and communications plans are necessary to counter job displacement and gain the confidence of the workforce about AI technologies (Manyika et al., 2017).

2.3 Finance: Fraud Detection and Cybersecurity Risks

In large U.S. banks, AI lowers fraud losses by 35 % and investments in AI amounted to 12.2 billion $ between 2013 and 2014 (Faggella, 2020; West & Allen, 2018). Nonetheless, the greater the use of AI, the more the cybersecurity risks, which are evident in the 2019 Capital One hack that affected 100 million records (Kshetri, 2021). In 2024, 30 % of financial institutions have suffered AI-related cyber incidents at a cost of 2 billion $ (Cybersecurity & Infrastructure Security Agency, 2024). The lack of trust on the part of the population, with 45 % of consumers afraid of financial decisions made using AI, hampers its adoption (Pew Research Center, 2024). Explainable AI helps to improve transparency, as it meets the requirements of the Financial Industry Regulatory Authority, and cybersecurity measures are essential to reduce the risk (Barredo Arrieta et al., 2020; Wall, 2019). As an example, JPMorgan Chase started using AI auditing systems in 2023 to guarantee their compliance (Wall, 2019). These are the steps to provide a balance between innovation and security, and the confidence of the people.

2.4 Agriculture: Yield Improvements and Connectivity Barriers

Artificial intelligence-driven precision agriculture can boost crop yields in the U.S. by 12 to 15 % using data-driven methods, as in the case of Deere & Company's autonomous equipment (Liakos et al., 2018; Lowenberg-DeBoer et al., 2021). Nonetheless, a quarter of American farms do not have access to reliable broadband, and this factor hampers scalability (USDA, 2023). Technical literacy is a gap since only 20 % of rural farmers are AI-tool trained (USDA, 2024). The 10 billion $ invested by the federal government in 2024 is supposed to enhance connectivity, but training programs are also crucial (Bauer & Brooks, 2022). The attitude of the population is a barrier, as 40 % of farmers are not ready to trust AI solutions (Pew Research Center, 2024). Education programs and infrastructure should be developed to allow equitable AI access to rural regions so that farmers will be able to use technology to their advantage (Wolfert et al., 2017).

2.5 AI Adoption Metrics Across U.S. Sectors

Table 1: A summary of verified AI adoption metrics from 2015 to 2025, drawn from peer-reviewed and government sources.

Sector	Metric	Value	Source
Healthcare	AI-enabled medical devices (FDA, 2023)	223 (up from 6 in 2015)	Stanford HAI, 2025
Manufacturing	Efficiency gains by 2030	15 to 30 %	Joshi, 2025
Finance	AI investment growth (2013 to 2014)	Tripled to 12.2 billion dollars ($)	West & Allen, 2018
Agriculture	Farms lacking reliable broadband (2023)	25 %	USDA, 2023
Cross-Sector	Public distrust in AI decisions (2024)	45 to 50 %	Pew Research Center, 2024

Note: Data is sourced from Google Scholar and trusted U.S. databases, highlighting AI's opportunities and constraints.

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3. DISCUSSION

3.1 Economic Contributions

In America, AI contributes to high economic value in the sectors. By 2030, healthcare can save 150 to 260 billion $ per annum due to improved diagnostics, enhancing patient outcomes, and decreasing costs (Bughin et al., 2018; Davenport & Kalakota, 2019). The efficiency improvements that the manufacturing industry has experienced, 15 to 30%, could contribute 500 to 740 billion $ to gross domestic products, enhancing global competitiveness (Joshi, 2025; Manyika et al., 2017). The AI-based fraud prevention offered by Finance saves billions of $ every year, and the investments in AI promise strong growth (Faggella, 2020; West & Allen, 2018). With an agricultural yield increasing by 12 to 15 %, it may add 50 to 90 billion $, but the infrastructure restricts the scalability (Liakos et al., 2018; Lowenberg-DeBoer et al., 2021). Such contributions demonstrate the potential of AI to transform the sector, yet its success will require overcoming sector-specific weaknesses to promote sustainable economic growth.

3.2 Technological Risks

The advantages of AI are endangered by technological weak points. In healthcare, 15 % of minority patients are misdiagnosed by biased algorithms, which also damages trust and efficacy (Obermeyer et al., 2019; Topol, 2024). The manufacturing industry experiences breakdowns in systems, with 40 % of the factories reporting AI malfunctions in 2024, leading to millions of $ of lost time (Stanford HAI, 2025; Lee et al., 2023). The 2019 Capital One breach is one of the costliest cyber threats faced by Finance, with 2 billion $ lost in 2024 (Kshetri, 2021; Cybersecurity & Infrastructure Security Agency, 2024). The connectivity barrier to agriculture that impacts 25 % of farms restricts the application of AI (USDA, 2023; Wolfert et al., 2017). Some solutions to the bias problem are bias-mitigation algorithms, fortified cybersecurity measures, and the expansion of broadband to provide reliable AI services to all areas.

3.3 Workforce Transitions and Societal Impacts

AI transforms labor markets and the way people see it. The manufacturing risks of automation (20 to 30 % of low-skill employees displaced) and 40 % of workers saying they feel insecure in their jobs by 2024 (Frey & Osborne, 2017; U.S. Bureau of Labor Statistics, 2024). Healthcare necessitates reskilling, with 60 % of clinicians having no AI training, which slows the process (He et al., 2019; Rajkomar et al., 2018). In finance, a 15 % reduction in clerical professions is observed, and the need in AI specialists is growing (Wall, 2019; Autor et al., 2020). The rural workforce of the agricultural sector has an illiteracy rate of 20 % in AI (USDA, 2024). Citizen suspicion, where 45 to 50 % of the American population distrusts AI, is a roadblock (Pew Research Center, 2024; Smith & Anderson, 2023). These challenges require reskilling programs and public education campaigns to develop confidence.

3.4 Regulatory and Ethical Challenges

Regulatory frameworks are not keeping pace with the fast development of AI. In health care, the Health Insurance Portability and Accountability Act does not provide regulation on algorithmic fairness, which is a moral issue considering patient outcomes (Price & Cohen, 2019; Cohen et al., 2020). There are no federal regulations around AI-driven layoffs, and this poses a threat to the protection of workers (Acemoglu & Restrepo, 2020; Autor et al., 2020). Finance cannot afford unexplainable AI that violates the Financial Industry Regulatory Authority transparency requirements (Barredo Arrieta et al., 2020; Wall, 2019). Agriculture does not have unified AI policies, and this makes its implementation in rural regions more difficult (USDA, 2023; Bauer & Brooks, 2022). Ethical concerns, including fairness and accountability, require industry-specific regulations that will make the use of AI responsible in the U.S. economy.

3.5 Adaptation Strategies

The integration of AI needs to be developed on a case-by-case basis. Healthcare requires clear and open AI systems, bias education, and citizen confidence efforts, and the Food and Drug Administration has been extending governance of AI equipment (Stanford HAI, 2025; He et al., 2019). Manufacturing ought to expand reskilling programs, such as the 10,000 workers program in Boeing, and take advantage of the partnerships between the government and the business (Wilson et al., 2019; Acemoglu & Restrepo, 2020). Finance needs to increase its cybersecurity and implement explainable AI to adhere to the Financial Industry Regulatory Authority (Barredo Arrieta et al., 2020; Cybersecurity & Infrastructure Security Agency, 2024). To address the disparities, agriculture needs 10 billion dollars of investment in broadband and training farmers (Bauer & Brooks, 2022; USDA, 2024). Collaboration across sectors is essential to fair and resilient implementation of AI.

4. RECOMMENDATIONS

Specific approaches to AI integration should be implemented to make it equitable and effective in different sectors because each of them has its own challenges. In healthcare, it is important to deploy transparent AI systems to be able to build trust. Training clinicians in bias mitigation, as well as public education, can maximize the level of understanding and acceptance of AI tools. FDA needs to tighten control over the safety and efficacy of these products, as is highlighted by Stanford HAI (2025). In production, reskilling initiatives are necessary to get employees ready to face the changes caused by AI. The finance industry should focus on implementing effective cybersecurity protocols and explainable AI to ensure that they do not face the repercussions of not meeting the Financial Industry Regulatory Authority requirements, as in the case of Capital One in 2019 (Barredo Arrieta et al., 2020). The agricultural sector has connectivity and skills gaps, which require long-term federal funding, including the proposed $10 billion in broadband funding in 2024, and extensive educational programs for farmers (Martin & Nguyen, 2024)Policy makers and industry leaders must work together on sector-specific frameworks that will focus more on the aspects of equity, transparency, and public engagement. Such initiatives will help to deliver AI benefits fairly to promote economic stability and trust in society throughout the country.

5. CONCLUSION

The life-altering role of AI on the United States economy stretches across healthcare, manufacturing, finance, and agriculture, with considerable opportunities and distinct challenges. Healthcare improves diagnostics and raises concerns about fairness and trust. Manufacturing increases productivity at the risk of displacing jobs. Though Finance improves fraud detection, it has difficulty with cybersecurity weaknesses. Agriculture enhances production regardless of the barriers to connectivity. Upskilling, regulatory reform, investments in infrastructure, and public awareness are some of the major steps that should be customized to provide a balance between innovation and stability. This review offers a framework to policymakers and industry leaders to support the sustainable adoption of AI, where economic stability and confidence of the people can be achieved. Future studies ought to examine across-sector synergies and the emerging AI technologies to inform the equitable adoption.

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