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Taxing Automation in Africa: Balancing Innovation and Socio-Economic Equality in the Fourth Industrial Revolution

Authors:

Mziwendoda Cyprian Madwe (madwem@unizulu.ac.za)
University of Zululand, Empangeni, South Africa

Alexander Oluka (olukaam@gmail.com)
European University Viadrina, Frankfurt (Oder), Germany

Phaswana Frans Mmatli (mmatlip@unizulu.ac.za)
University of Zululand, Empangeni, South Africa

Abstract:

The implementation of artificial intelligence (AI) and robotics is transforming nations worldwide, triggering discussion about their socio-economic impacts and appropriate regulatory responses. While extensively debated in developed economies, this issue remains underexplored in Africa- a region facing unique developmental challenges and opportunities. This systematic review explores the implications of automation, robotics and AI on income inequality, employment and taxation policies, focusing on literature published between 2017 and 2024. For this purpose, as search was carried out in Scopus and Google Scholar databases. A total of 78 papers were found, and after analysing them according to the PRISMA Statement 2020, a total of 36 papers were selected. The review indicates that automation and AI excessively impact low-skilled employees, worsening income disparity, while high-skilled workers benefit from increased salaries. Moreover, analysis indicates that robot taxation and investment in higher education are potential interventions to mitigate these adverse socio-economic effects of technological innovation. The review suggests that government and policymakers should consider tax policies to fund educational institutions to equip citizens with the skills needed in the digital age. The paper offers practical insights for policymakers on robot taxation and labour force and advances understanding by proposing a framework for addressing automation-driven inequality internationally.

Keywords:

Taxing Robots, Artificial Intelligence in Africa, Socio-economic Impact of AI, Policy Trade-Offs in Innovation, Income Inequality and Automation.

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Introduction

The Fourth Industrial Revolution (4IR) is reshaping economies and industries globally through the integration of artificial intelligence (AI) and robotics (Oosthuizen, 2022). These technologies offer unprecedented productivity gains but simultaneously pose significant socio-economic challenges, particularly in emerging regions like Africa. Among these challenges are concerns about unemployment, widening income inequality, and shrinking government revenues due to the automation of human labour (Abbott & Bogenschneider, 2017; Rawashden, 2023). As cost of automation technologies decreases, their implementation increases, leading to potential job losses and demanding a re-evaluation of tax frameworks that disproportionately tax labour while incentivising technological capital investments (Avancena, DeLuca, Lott, Mauri, Miller, Eisenberg & Hutton, 2021; Parschau & Hauge, 2020; Merola, 2022).

The rapid Artificial Intelligence (AI)-driven automation and robotics pose a dual challenge: encouraging technological innovation while ensuring socio-economic stability. The current tax frameworks generally favour AI-driven automation by taxing human labour more heavily than technological capital investments, creating fiscal imbalances and aggravating inequality (Fall, 2022; Khogal & Mekid, 2023). The global debate about robot taxation highlights broader concerns about balancing economic growth with social equity. Prominent figures like Bill Gates have advocated for robot taxation to support displaced employees, while other, including Lawrence Summers, argue that such policies may prevent technological innovation (Mann, 2019). Given Africa's unique socio-economic and industrial landscape, the viability and impact of robot taxation require further research.

This systematic review aims to answer the following research question: How can robot taxation policies be designed and implemented in Africa to address socio-economic challenges such as income inequality, job displacement, and declining tax revenues while fostering technological innovation and economic development? To address this question, the review focuses on the following objectives:

- To examine the socio-economic impact of AI-driven automation in Africa in the context of tax revenue and employment
- To assess the applicability of the global robot taxation to Africa's unique challenges and opportunities, and
- To propose policy recommendations that promote technological innovation while ensuring social and fiscal equity.

Robot taxation refers to fiscal policies that impose taxes on AI-driven technologies to address job displacement, income inequality, and declining government revenues (Acemoglu & Restrepo, 2018). The rationale behind such policies is that as automation increasingly substitutes human labour,

economic benefits should be equitably distributed, with companies bearing financial responsibility for addressing societal implications. Potential taxation measures include:

1. Direct taxation of robots- imposing taxes on companies based on the number of automated systems replacing employees
2. Taxing AI-driven automation-related profits- Levying higher taxes on firms benefiting from automation, with proceeds used for employees reskilling and social support initiatives
3. Reducing tax incentives for AI-driven automation- Adjusting tax allowance to prevent excessive automation tax incentives and maintain employment stability

In Africa, the taxation of robotics presents a complex policy dilemma. While robot taxation has the potential to mitigate inequalities by redistributing revenues toward displaced workers, it may also slow industrial growth and discourage much-needed technological investment (World Bank, 2016; Carbonero, Ernst & Weber, 2018). Political stability and governance may impact robot taxation integration. However, countries with fragile political environment, such as Central African Republic and Sudan, may encounter difficulties in enforcing new taxation policies. Conversely, stable countries like Nambia and Mauritius may be better positioned to adopt such framework (Fall; Mpofu, 2022). Mpofu (2022) argues that the degree of firm AI-driven automation varies across Africa. In resource-dependent countries like Anglola and Mozambique, automation's impact on job displacement remains minimal, making robot tax less relevant (Mpofu, 2022). However, in these nations with emerging manufacturing firms, such as Ethiopia and Kenya, automation presents more significant challenges, warranting consideration of fiscal interventions (Oosthuizen, 2022).

The African labour markets remain heavily dependent on low-slikked and informal employment. The risk of AI-driven automation displacing employees is high in certain n industries, demanding strategic fiscal policies balance economic growth with job security (World Babk, 2021; Ndung'u, 2020).

The implementation of AI-driven automation is revolutionising government revenue generation models by reducing dependence on labour income tax, which conventionally funds essential public services (Alhosani & Alhashmi, 2024). As wealth shifts from labour to capital, wage-tax revenues declines, creating fiscal pressures, particularly in nations with weak capital gain taxations (Merola, 2022; Bestani & Waldenstrom, 2024). In Africa, where tax systems are still developing, governments must examine diversified revenue sources, including AI-powered-related taxation, to sustain economic stability and equitable developments.

The review is underpinned by two theories, which are Technological Determinism Theory, Fiscal Redistribution Theory. Technological Determinism Theory argues that technological advancements shape societal transformation, demanding policy adaptations to address emerging challenges (Hauer, 2017). In the context of robot taxation, this theory highlights how AI-driven automation reshape labour

markets, wealth distribution and fiscal structures. It underscores the necessity for tax policies that accommodate rapid technological progress while ensuring economic stability.

Fiscal Redistribution Theory advocates for equitable resource allocation through taxation, particularly to counter economic disparities based by technological change. In the context of robot taxation, this theory supports levying automation-related taxes to fund social nets, unemployment benefits and employees retraining programs. The objective is to ensure that the benefits of automation do not exacerbate existing inequalities but instead contribute to inclusive economic growth (Musgrave & Musgrave, 1989).

This systematic review argues that a nuanced approach to robot taxation can foster technological innovation while mitigating automation's adverse socio-economic effects. Given Africa's unique economic structure, high unemployment rates and technological disparities, a blanket approach to robot taxation may not be feasible. Instead, adaptive policies tailored to each country's industrial environment and fiscal capacity are essential. This introduction sets the stage for analysing the global discourse on robot taxation, Africa's distinct socio-economic realities, and the policy pathways that can ensure inclusive and sustainable development. This research offers an in-depth analysis of international robot taxation models and their potential applicability to Africa, providing policy recommendations aimed at balancing innovation with socio-economic equality.

Method and Data

The study employs a Systematic Literature Review (SLR) methodology, adhering to the PRISMA Statement framework to ensure rigour and transparency (Moher et al., 2009). The PRISMA Statement was used model to answer a research question using a replicable and systematic process. The PRISMA framework and dual-database approach ensure comprehensive and interdisciplinary coverage (Falagas et al., 2008). Thematic synthesis distils diverse findings into actionable insights, enhancing relevance for policy and practice (Thomas & Harden, 2008).

After the inclusion selection process was carried out, based on pre-determined criteria, the main results of the selected works were codified and extracted in order to synthesise and provide an answer to the research question.

The study included studies investigating the impact of robots, AI and automation on job displacement, income inequality and government tax revenue. Only published in peer-reviewed journals and published in 2017 and 2024. The 2017 -2024 aligns with the most recent technological advancements and policy development in AT and robotics (Schwab, 2016). The peer-review journals ensure credibility and quality of information. The Language used for the search was English. Once the search had been completed, the inclusion and exclusion criteria used were those set out in Table 1.

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Inclusion Criteria	**Exclusion Criteria**
Published between 2017 and 2024	Published before 2017 or after 2024
English language	Not in English
Empirical research or relevant systematic reviews	Opinion pieces, editorials, or unrelated reviews
Peer-reviewed journal articles	Not published in peer-reviewed journals
Focus on AI, robotics, or automation in economic contexts	No mention of AI, robotics, or automation
Analysis of job displacement, income inequality, or tax revenue	Not related to job displacement, income inequality, or tax
Discusses taxing robots or AI impact on socio-economic factors	No discussion of robot taxation or socio-economic impacts

Table 1: Inclusion and Exclusion Criteria

To ensure an understandable search procedure to identify most keywords for this study, the co-occurrence analysis was conducted as recommended by Gonzalez-Calatayud, Prendes-Espinosa and Roig-Vila (2021). From this analysis, the study identified the following as the most relevant terms: 'Taxing Robots,' 'Artificial Intelligence in Africa,' 'Socio-economic impact of AI and automation,' 'Policy-Trade-Offs in Innovation,' and 'Income inequality and Automation.'

The papers included were identified by searching electronic databases published in English. The search was conducted in two databases: Scopus and Google Scholar. All relevant papers were obtained. The Scopus was chosen because of its high-impact peer-reviewed literature, and it was validated by the academic community (Tavares, Azevedo, Marques & Batos, 2023). Google Scholar to capture grey literature and region-specific policy literature.

The Boolean operators were designed to combine these terms to make the search with these terms more concrete. The Boolean operators used in the two databases were:

Scopus: (TITLE-ABS-KEY("**taxing robots**") OR TITLE-ABS-KEY("**artificial intelligence" AND "Africa**") OR TITLE-ABS-KEY("**automation" AND "socio-economic impact")** OR TITLE-ABS-KEY("**income inequality" AND "robotics"**) AND TITLE-ABS-KEY**("policy trade-offs")).**

Google Scholar: ("taxing robots" OR "artificial intelligence in Africa" OR "automation and socio-economic impact" OR "income inequality and robotics" OR "policy trade-offs in automation")

The papers were assessed and selected according to the criteria set out in Table 1. The titles and abstracts were assessed independently, and once selected, the articles were analysed in full. To conduct

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the analysis of the papers, the Rayyan Tool was used in this research to allow the review to be conducted through the blind mode. This tool facilitates efficient management of exclusion and inclusion criteria, it also identifies and flags duplicates ensuring that only unique studies are included for analysis. The researchers recommend the use of Rayyan for reducing screening time, ensuring transparency during the selection and systematic review process (Ouzzani, Hammady, Fedorowicz & Elmagarmid, 2016; Valizadeh, Moassefi, Nakhostin-Ansari, Hossein Asl, Torbati, Aghjani, Ghorbani & Faghani, 2022).

The Rayyan tool was employed for categorising papers. For extraction and analysis of the main information in the articles, pre-defined inclusion and exclusion, as per Table 1, were used to extract relevant information. The data extraction was designed to organise information according to author(s), publication years, journal, and geographic focus. The extracted data was then analysed through a thematic analysis approach.

The reasons for conducting a systematic literature review were to summarise the existing evidence regarding the socio-economic impact of automation and AI, focus on tax revenue and employment, and assess the applicability of the global robot taxation model to the continent's unique challenges and opportunities. A systematic review was also carried out to identify gaps in this area and help develop future research agendas. The following PRISMA Statement was used to complete the systematic review reporting for researchers seeking to determine the trustworthiness and applicability of the review findings.

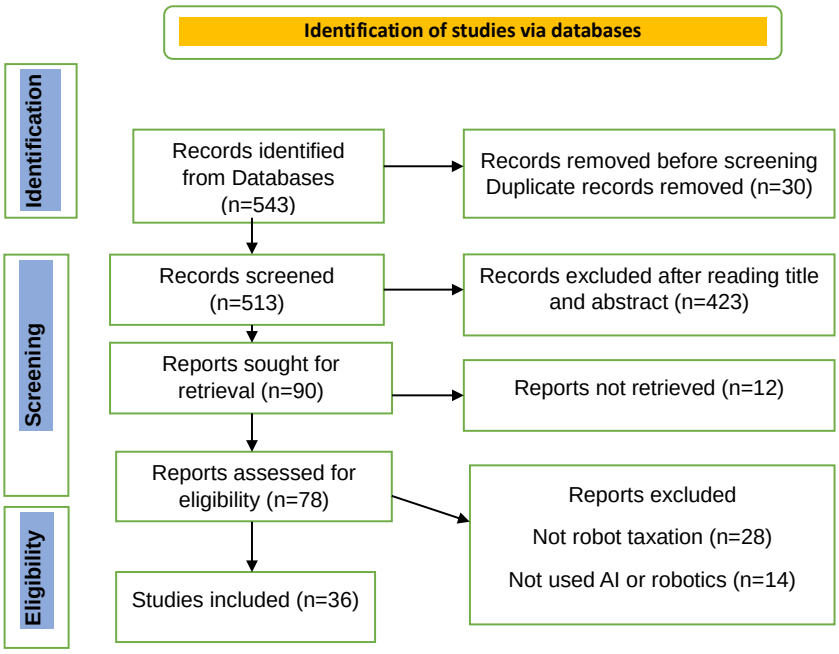

Figure 1: PRISMA Statement 2020 diagram
(Source: Authors' owns elaboration adapted from Page et al. (2021))

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Discussion

Of the 513 papers reviewed after the removal of duplicates, 423 were excluded as they did not comply with the pre-determined inclusion criteria set out in Table 1. Subsequently, the full text of the remaining 90 articles was reviewed, excluding 47 for failing to comply with the criteria and an additional 12 for not having access to them.

The results from Table 2 indicate the distribution and focus of international studies on the socio-economic effects of automation, robotics and AI. Prior research primarily covers the years 2017-2024, reflecting the suitability and relevance of the topic amid ongoing advancements in these technologies. This study shows a diverse yet uneven geographical representation, showing significant regional and thematic trends. Table 2 indicates that developed nations, such as the USA, Australia, and European countries, have focused on investing in AI and automation's influences on employment, wage inequality, and fiscal policies, including the taxation of robots and other technological advancements (Acemogle & Restrepo, 2018). This focus shows the advanced technological systems and robust policy discussion dominant in these nations, supporting the thorough investigation of the economic and labour market effects of automation, robotics and AI.

Table 2 also reveals that input from emerging countries, specifically in Asia (India, China, and Indonesia), predominantly concentrates on automation's consequences on inclusive employment and income inequality. This concentration supports the socio-economic problems these regions face, where technological commotions must be attended to alongside endeavour to accomplish equitable growth and reduce imbalances. Analogously, research from South America is limited, with only Brazil and Peru represented, leaving significant gaps in the broader understanding of automation's consequences in this continent.

The results from Table 2 reveal a scarce representation of studies from Africa, with only two countries, South Africa and Tunisia, contributing to the discourse (Mpofu, 2022). These studies accentuate fiscal policies, especially taxation within the digital economy, and the impact of AI on employment. However, the absence of contributions from other sub-Saharan African countries limits insights into the broader implications of robotics and automation for the African labour market. This gap indicates a need for an expanded research effort to address Africa's unique socio-economic challenges and opportunities in adopting these technologies.

Regional gaps in research are further evident, as Table 2 shows most studies are from Europe and Oceania. European researchers provided a mix of perspectives from both developed and developing contexts, while Oceania focuses on AI's influence on unemployment and income inequality. Despite

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these contributions, the lack of studies from several regions, particularly sub-Saharan Africa and parts of South America, indicates a significant imbalance in global research works.

Appearing themes from Table 2 show a dual focus across nations. Developed countries primarily explore the fiscal policies and labour market consequences of AI and robotics, such as job displacement and taxation policies, while emerging countries prioritise issues of wage and employment inclusion. These thematical trends underscore the importance of localised research in addressing region-specific challenges and formulating appropriate policy interventions.

First Author	Year	Journal	Country	country Type	Continent	Author Affiliation	Research focus
Mpofu, F. Y	2022	Economies	South Africa	Developing	Africa	University of Johannesburg	Taxation of digital economy
George, S. A	2024	Partners Universal International Journal	India	Developing	Asia	Independent researcher	Technological advancement on job losses
Body, J. A	2019	Futures	Lithuania	Developed	Europe	ISM University of management and Economics	Automation and employment
Maik, H	2020	Internation Journal of Social Economics	Lithuania	Developed	Europe	ISM University of Management and Economics	Taxation of robots
Silmi, T. A	2024	Advances in Global Economics and Business Journal	Indonesia	Developing	Asia	Brawijava University	AI on employment and income inequality

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Reis, J	2021	Brazilian Journal of Operations & Production Management	Portugal	Developed	Europe	University of Aveiro	AI impact on public administration
Ozcan, R	2019	Oneri Dergis	Turkey	Developing	Asia	Instanbul University	Robots' effects on employment and income
Lei, Y	2024	Annual Review of Sociology	USA	Developed	North America	Harvard University	AI and robots on work
Du, J	2024	International Journal of Social Sciences and Public Administration	Australia	Developed	Oceania	Macquarie University	AI adoption on employee unemployment
Acemoglu, D	2019	Journal of Economic Perspectives	USA	Developed	North America	Massachusetts Institute of Technology	Taxing technological advancements
Lu, Y	2021	Journal of Economic Surveys	Australia	Developed	Oceania	Australian National University	AI impact on employment and income inequality
Dhanabalan, T	2018	International Journal of Mechanical Engineering and Technology	India	Developing	Asia	Alagappa University	AI and job losses in 4IR

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Nam, K	2020	Electron Markets	Sharjah	Developing	Asia	American University of Sharjah	AI and robots on replacing people
Oosthuizen, R. M	2022	Front. Artif. Intell	South Africa	Developing	Asia	University of South Africa	AI and robots replacing jobs
Makridakis, S	2017	Futures	Cyprus	Developing	Europe	University of Nicosia	AI on society, life and employment
Trabelsi, M. A	2024	Journal of Electronic Business & Digital Economics	Tunis	Developing	Africa	University of Tunis El Manar	AI on employment
Virgilio, G. P. M	2024	International Journal of Social Economic	Peru	Developing	South America	Universidad Catolica Sedes Sapientiae	AI on unemployment
Abbott, R	2018	Harvard Law & Policy Review	USA	Developing	North America	University of California	Robot tax and tax policy
Zhang, P	2019	International Review of	China	Developing	Asia	Nanjing University	Automation, wage inequality and robot tax
Lankisch, C	2019	Economic Modelling	Austria	Developed	Europe	Vienna University of Technology	Robots and wage inequality
Xin, B	2024	Technology in Society	China	Developing	Asia	Shandong University of Science and Technology	Robotics, inclusive employment and income disparity

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Frey, C. B	2017	Technological Forecasting and Social Change	England	Developed	Europe	University of Oxford	Future employment and computerisation
de Sio, F. S	2021	Critical Review of International Social and Philosophy	Netherlands	Developed	Europe	Eindhoven University of Technology	Future of works and capital in the age of AI
Ramaswamy, K. V	2022	International Review of Business and Economics	India	Developing	Asia	Indira Gandhi Institute of Development Research	Robots and automation and availability of jobs for labour force
Shaukat, K	2020	Trends in Computer Science and Information Technology	Australia	Developed	Oceania	University of Newcastle	Automation, robots and job skills
Jimeno, J. F	2019	SWRIEs	Spain	Developed	Europe	Universidad de Alcalá de Henares	Automation and AI and employment
Nolan, B	2019	Journal of Economic Saverys	UK	Developed	Europe	University of Oxford	Robots and income inequality
Filippi, E	2023	Technological Forecasting and Social Change	Italy	Developed		University of Trento	Automation technologies and employment
Lima, Y	2021	Societies	Brazil	Developing	South America	Federal University of Rio de Janeiro	Technological unemployment and solutions

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Pan, M	2018	Journal of Cleaner Production	China	Developing	Asia	University of Hong Kong	Automation and sustainability
Halteh, J	2018	Journal of the Social and Economic Relation of Work	New Zealand	Developed	Oceania	Massey University	Technology and employment
Xiao, A	2024	Humanities and Social Sciences Communications	China	Developing	Asia	Sichuan University	Technological innovation and income inequality
Walsh, T	2018	International Journal of Automation and Computing	Australia	Developed	Oceania	University of New South Wales	Technological Unemployment
Wajcman, J	2017	The British Journal of Sociology	UK	Developed	Europe	London School of Economic	Automation and future Jobs
Chuang, Z	2018	European Journal of Training and Development	USA	Developed	North America	Indiana State University	Technological on jobs, employments and human resource
Tuan, L (36)	2024	Heliyon	China	Developing	Asia	Harbin Finance University	Digital economy and income inequality

Table 2: Characteristics of Selected Studies on the Socio-Economic Impact of Robotivs and AI-Driven Automation

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Technological Advancements and Income Equity

From the review of existing studies indicates a significant association between AI-powered automation, roboticsand income inequality, underscoring the socio-economic impacts of technological advancements. These technological innovations disproportionately affect middle-class jobs, leading to uneven distribution of income among households within society. Nolan, Richiardi and Valenzuela (2019), Merola (2022), and Tian and Tiang (2024) identify technological innovation as a driving force behind the erosion of middle-income jobs, leading to greater income inequality between high-income and low-income households.

One protruding intervention strategy debated in the prior research is robot taxation. Zhang (2019) explored its impact and found that taxing technological could alleviate wage inequality by reducing after-tax profits of the robot-producing sector. This methodology allows for a relocation of resources, which can be directed toward addressing the social disparities created by robotics, AI and automation. For instance, revenue derived from technological innovation taxation could be directed to support skills development programs, proving a practical mechanism to mitigate the adverse effects of technological advancements on vulnerable populations.

The systematic review also indicates the uneven consequences of technological innovation on human labourers with different skill levels. Xiao, Xu, Skare, Qin and Wang (2024) observed that low-skilled labourers are disproportionately affected, often encountering job displacement and reduced earning capacity. In contrast, high-skilled employees benefit from higher salaries and wages, especially those in developed countries. This discrepancy is intensified by the scarcity of high-skilled employees in emerging countries, further widening the income gaps between developed and emerging countries.

The literature underscores the key role of higher education institutions and skill training in diminishing the negative effects of technological innovations. Xioa et al. (2024) contend that this approach is the most effective to equip employees to adapt to the changing demands of the labour force. By improving the skills of low-skilled employees, higher education institutions can assist them in transitioning into high-skilled roles and sharing the benefits of technological advancements. Furthermore, the systematic review indicates the potential of robot tax revenue as a funding source for such initiatives, ensuring a sustainable and equitable method to reduce unemployment and income inequality.

The results from analysis of previous studies indicate that robotics, automation and AI exacerbate income inequality by backing high-skilled employees while sidelining low-skilled workers. However, policy interventions such as robot taxation and investment in higher education present feasible corridors to tackle these techno local income inequality and unemployment. These findings highlight the significance of a coordinated strategy for managing the social effects of robotics, AI and automation.

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Technological Innovation and Government Tax Revenue

The analysis of prior research indicates the intense consequences of AI, automation, and robotics on government tax revenue systems. As these innovations reduce reliance on human being labour, they concurrently challenge the traditional taxation framework, which depends profoundly on personal income taxation. For example, Alhosani and Alhashmi (2024) stress that many governments rely on payroll-based taxes to fund essential public services. However, as robotics, automation, and AI lead to job supplantation, tax revenue generated from wage-based taxes is likely to drop, creating fiscal inequality (Meroal, 2022). job supplantation (displacement) triggered by technological innovations influences contribution to social security systems, particularly in countries where tax models are profoundly dependent on personal salaries and wages (Bestani & Waldenstrom, 2024). This shift in earning from labour to capital further complicates fiscal systems, as taxing automated workers is often less effective than taxing human employees (OECD, 2022). Researchers recommend taxation on technology-driven gains or levies on corporate profits derived from automated employees to deal with these difficulties. These action mechanisms help to stabilise tax revenue streams, guaranteeing governments can continue to fund public goods and services.

In the African context, these fiscal challenges are especially acute due to limited technological infrastructure, high unemployment levels and dependence on traditional tax bases. South Africa, for instance, relies heavily on personal income tax and consumption tax, putting it at risk of shifts in employment patterns triggered by automation, AI and robotics (Ndung.u, 2020; Mpofu,2022). The systematic review recommends that adaptive fiscal policies that expand tax sources and target technology-driven manufacturing can alleviate these vulnerabilities.

Technological Innovation Taxation

The analysis from a review of prior research highlights compelling backup for taxation of automated workers, robotics and AI as measures to deal with socio-economic commotions triggered by technological advancements. Gates (2017) accentuates that taxation on technological progress could generate revenue to fund labour force retraining programs, social welfare initiatives (e.g., Child grants, foster child grants, Old-age pension grants, disability grants), and income redistribution mechanisms. Similarly, Abbott and Bogenschneider (2018) indicate that such taxes could lessen the drop in income tax collection by redistributing the economic gains of automated workers and robotics.

In developed countries, the literature suggests that automation-driven replacement of human being employers worsens income inequality due to tax frameworks that sympathise with capital investment over labour (Arntz et al., 2017). Supporters argue that redistributing revenues through processes such

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as universal basic income (UBI) could provide a safety net for replaced employees, which would help them deal with economic inequality (Merola, 2022).

The analysis from the systematic review identifies numerous implementation approaches for robot taxation. Recommendations range from direct levies on automated activities to increase company taxes for firms profoundly dependent on robotics and automation. Taxes' revenue from taxation is viewed as a means to fund equity-promoting initiatives, including investment in businesses with high employment potential, such as healthcare, green energy, and education (Rahman, 2023). The refutation of robot taxation by the European Parliament in 2017 highlights concerns about the probable limiting effects on innovation and international competitiveness (European Parliamentary Research service, 2017). This underscores the significance of balancing taxation with policies that do not stifle technological progress.

Robot taxation appeared in the review as an effective solution, especially for nations in the early stages of automation adoption. South Korea's approach, which involves reducing capital allowances (tax incentives) for automation equipment, offers a distinct strategy that encourages technological adoption while addressing socio-economic inequalities (Kim, 2021). For Africa, high unemployment and inadequate fiscal resources demand innovation strategies that infuse labour force retraining with inclusive growth programs. The review indicates that fiscal mechanisms such as capital allowance and research and development tax credits promote innovations while guaranteeing fair benefits for small and medium enterprises and marginalised populations (Acemoglu & Restrepo, 2020).

While taxation of innovation progress offers opportunities to deal with socio-economic disparities, the analysis identifies profound challenges. Acemoglu and Restrepo (2018) warn that taxation of technological progress might erode the broader economic benefits of robotics, AI and automation. Instead, they suggest inclusive policies that promote technological advancement without penalising adoption.

Conclusion

The review aims to explore the feasibility, implications, and policy considerations of taxing robots and artificial intelligence (AI) in Africa, focusing on its socio-economic impacts, particularly on tax revenue and employment. The study indicates the major socio-economic consequences of technological innovation such as AI, automation and robotics. The systematic review highlights that these technological advancements worsen income disparity, replace low-skilled workers, and disrupt conventional taxation bases, particularly in nations with high unemployment and limited technological infrastructure. However, tactical intercedence like technological innovation taxation and investment in skill training provide feasible pathways to deal with these challenges.

The study highlights the critical need for policies that balance the economic benefits of technological advancements with their socio-economic impacts. Robot taxation, vocational training, and adaptive fiscal policies emerge as potential solutions to mitigate the challenges posed by automation, robotics, and AI.

While the study offers worthy insights, specified limitations should be admitted. The geographical focus of much of the prior research is primarily on developed countries, leaving substantial gaps in comprehending the consequences of AI, robotics and automation on developing nations, particularly in sub-Saharan Africa and South America. Contextual variability further complicates the generalisability of the results, as differences in technological adoption, labour market structures and fiscal policies vary widely across socio-economic contexts. Addressing this limitation in future studies can provide more understanding and actionable insights, particularly for underrepresented nations.

Governments are urged to implement technological innovation taxation to redistribute the benefits of automation and AI. The revenue from these taxes could be allocated towards labour force retraining programs, social welfare programs, and policies targeted at lowering income inequality. Additionally, investment in universities, colleges and skill development are crucial. By training low-skilled employees with the necessary competencies to transition into high-demand, high-skilled positions, governments can ensure more impartial sharing of the benefits of technological advancements.

The study recommends adaptive fiscal policies to diversify tax bases and introduce levies on automation gains to stabilise revenue streams and continue to fund essential public services. To balance the promotion of technological innovation while addressing income inequality, unemployment and job displacement, the study recommends policies like South Korea's reduction of accelerated depreciation for automated employees and robotics to foster technological growth while encouraging equity.

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