



Sustainable growth and human welfare in the age of artificial intelligence: A theoretical perspective

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Abstract

The main objective of this study is to determine the factors affecting the choices of depositors in selecting banks for their deposits in Bangladesh. The study surveyed 300 respondents which are selected from the sample commercial banks. The survey took place in Dhaka and Kushtia cities. The result of the study has been assessed based on the likert scale of 5 points, where, 1 for Strongly Agree, 2 for Agree, 3 for Neutral, 4 for Disagree, and 5 for Strongly Disagree. The results of the study unearth that the safety of funds, secured transaction process, online banking facilities, and prompt service have significant positive influence, whereas political instability, high inflation rate, and high transaction costs have significant negative influence on the choice of depositors to select their desired banks in Bangladesh. The result of the study will surely be useful to policy makers and supervisory authorities of banks to formulate their policies so as to improve the performance of banks in Bangladesh.

Keywords: Banking system, commercial banks, depositors, likert scale, Bangladesh

Introduction

Artificial Intelligence has become an agent of change that has the potential to transform economies, institutions and daily life globally (Kumar *et al.*, 2024)^[10]. It is defined as computational systems which can be used to address problems like learning, pattern recognition, prediction, reasoning and decision support (Sarker, 2022)^[15]. The last 10 years have seen AI leave research laboratories to real-life use in various industries, such as manufacturing, healthcare, agriculture, education, public administration, transport and finance. It has served as a catalyst of digital transformation by its capacity to process large volumes of data, automate routine tasks and enhance the speed and quality of decision making. However, the emergence of AI has been possible at a moment when societies already experience various structural issues, including climate change, growing inequality, labour market instabilities, demographic pressures and disproportionate access to welfare. Thus, AI is not entirely a matter of innovation and productivity, but it should also be judged in the context of its impact on sustainable development and human welfare.

Modern meaning of sustainable growth does not rely on any increase in output or income. It is defined as a trend of development which can be sustainably continued without compromising social equity or environmental stability (Hariram *et al.*, 2023)^[8]. It demands economic development that will go hand in hand with decent jobs, equitable resource allocation, environmental balance and sustainability to the next generations. Welfare on the other hand goes beyond material income to cover access to health, education, social security, safe environments, dignity and the ability to lead a meaningful life. All these dimensions intersect with AI. It is able to enhance productivity, boost the delivery of the services to the people and facilitate even greater utilization of natural resources. Meanwhile, it also has the potential to introduce new types of exclusion when access to digital resources, information and capabilities is monopolized by a handful of companies, nations or social classes.

This paper presents a theoretical argument of sustainable growth and welfare during the age of AI. It discusses the role of AI in economic growth, changes to labour markets and welfare systems, effects on environmental sustainability and social justice. The article posits that AI is not to be considered the sole technological development but a socio-economic phenomenon the results of which are contingent on the governance, ethics and institutional design. Whether AI can create growth is not the real challenge, but whether it can be inclusive, humane and ecologically sustainable.

AI, Sustainable Growth and the New Development Paradigm

The connection between AI and sustainable growth should be interpreted in the context of an overall change in developmental thinking (Bjola, 2022)^[12]. In the traditional growth models, the main concern was on output increase, industrialization and productivity. Technological advancement was regarded as one of the main drivers of economic growth since it enhanced efficiency and boosted the productive power of labour and capital (Challoumis, 2024)^[4]. But the modern discourse of development has gone beyond GDP as the only indicator of development. Growth is now more and more determined by its quality, inclusivity and sustainability to the environment. Sustainable development path can be defined only through the creation of economic value and the ability to retain natural resources, decrease inequality and enhance social welfare.

In this regard, AI is a potential and a threat. On the good side, AI can facilitate sustainable growth through higher productivity, facilitating innovation and waste reduction in the economic systems (Kulkov *et al.*, 2024)^[9]. The manufacturing industry can use AI to optimise supply chains, forecast equipment failures and enhance quality control. In farming, it may be used in precision farming by providing improved irrigation control, identification of pests and crop forecasting. AI can be used to manage supply and demand in energy systems, enhance efficiency and integration of renewable energy sources. In the field of

public administration, it can help to improve the management of data, the targeting of policies and service delivery. All these applications tell us that AI can assist societies to create more efficiently and consume resources more wisely.

Meanwhile, sustainable growth presupposes that the advantages of technological advancement should be widely shared. AI is not necessarily the solution to generating inclusive prosperity. It is frequently reliant on access to information, digital infrastructure, high-level skills, and capital of investments, which is not evenly dispersed among companies and localities (Lincaru *et al.*, 2018)^[11]. Bigger companies and more technologically superior nations are in a better place to reap the benefits of AI, whereas smaller firms, less skilled employees and underdeveloped economies may fail to do so. Consequently, AI has the potential to increase the current productivity and income disparities unless corrective policies are available.

Another way AI alters the definition of development is through a shift in focus towards data, algorithms and digital capabilities instead of focusing on physical capital (Poquet & De Laat, 2021)^[13]. In the era of AI, the key drivers of long-term development will be knowledge systems, human capital, institutional trust and digital inclusion. It implies that technology cannot be used to attain sustainable growth on its own. It mandates government spending on education, digital infrastructure, research, regulation and social protection to ensure AI is incorporated into a larger development strategy as opposed to a specific instrument of profit maximization. In this manner, AI should be incorporated into a new development paradigm where growth is not just defined by efficiency gain but also its role in human welfare and environmental sustainability.

AI, Productivity and Economic Transformation

Among the most compelling arguments by the proponents of AI is that, it can be used to outgrowth economic growth through enhanced productivity and faster innovation (Erdil & Besiroglu, 2023)^[6]. AI helps companies and organizations to process various large amounts of data, automate repetitive processes, predict trends and enhance operations. In industries like manufacturing, logistics, banking, retail and healthcare, AI lowers transaction costs, improves accuracy and enables quicker decision-making. It is also involved in innovation as it assists the researchers to spot patterns, experiment with options and draw conclusions out of intricate data. These abilities indicate that AI can be a general-purpose technology that can radically change production systems just like electricity, computers or the internet did during previous times.

The productivity gains that are based on AI work in several ways. To begin with, AI can automate the system of routine administrative, analytical and operational tasks, giving workers and organizations the opportunity to waste less time and minimize errors (Lo *et al.*, 2024)^[4]. Second, it can aid forecasting and planning by determining patterns in the data that humans might not notice. Third, it may support the innovation of products and services through the ability to personalize, experiment quickly and create new digital business models. Such changes are able to boost production, reduce the expenses and enhance competitiveness. To economies that experience declining productivity growth, AI seems to be a new way of bringing dynamism to the economy.

However, productivity gains are not sufficient to ensure sustainable or welfare-enhancing effects. Economic history has demonstrated that technological advancement does not necessarily lead to a reduction in inequality, labour insecurity and environmental pressure provided that the gains are concentrated in the hands of the select few in the population (Acemoglu, 2002)^[1]. With AI, the threat of concentration is high due to the reliance of the technology on the availability of data, cloud computing platforms, qualified specialists and funding. This may generate a winner-takes-most dynamic whereby a handful of big companies take over digital markets and capture the bulk of the economic benefits. This could act to undermine competition, curtail opportunities at small businesses and curtail the dissemination of innovation as far as the larger economy is concerned.

In addition, the social worth of AI-driven productivity relies on whether returns are converted into higher wages, an enhanced working environment, low-cost services and enhanced public incomes (Bronner *et al.*, 2021)^[3]. In the event that AI merely lowers labour costs and enhances returns to capital owners, the effects of its growth can be economically impressive yet unequal in terms of social benefits. So, the most important question is not the extent to which AI can lead to productivity but the beneficiaries of that growth. To achieve sustainable economic change, it is necessary to have institutions linking technological efficiency to social progress. The tax policy, labour protections, and investment in digital infrastructure, as well as the competition law and systems of public innovation, all can help in ensuring that AI-driven growth serves to the common good, not structural rifts.

Labour, Employment and Welfare in the Age of AI

One of the most important welfare challenges in the modern development is the AI influence on labour markets (Cramarenco *et al.*, 2023)^[5]. Dignity, social integration and economic stability, a form of livelihood and a source of dignity is achieved through work. AI impacts labour by eliminating, augmenting and creating work. Unlike in the past when most automation projects were more on repetitive manual tasks, today AI is evolving to cognitive and service-based operations such as administration, customer service, data processing, translation, diagnostics and even content creation. This enhances possibilities and fears of technological change.

The positive side is that AI is able to improve the quality and efficiency of the work. It has the ability to relieve repetitive strain, improve decision making and allow employees to focus on creative, interpersonal and strategic activities. Applications of AI in healthcare, education, and manufacturing could assist doctors in diagnostics and managing data, educators in personalized learning, and maintenance and safety planning. In such instances, AI is augmenting instead of supplanting human abilities. With the appropriate training and organizational adjustment, productivity and job satisfaction can be increased at the same time with augmentation.

However, AI has a negative impact on employment and social well-being as well. Clerical, retail jobs, transport and administration jobs will be automated and middle skill jobs will be reduced as companies implement intelligent systems to reduce labor costs. This may help lead to a process of polarization of the labour market, where higher-skilled

workers receive more opportunities and others are left with stagnant wages, unemployment or precarious platform jobs. The monitoring of work performance, attendance and behaviour in the workplace, could also be enhanced by AI through analysis of algorithms. These systems will be able to enhance productivity and reduce autonomy, which will raise the level of stress and empower the employer.

The welfare consequences of these changes are very sensitive to policy and institutional responses. AI can be integrated in a manner supporting human welfare if societies invest in labour market transitions, portable social benefits, reskilling and lifelong learning. However, if workers are left to deal with the disruption costs alone, technological change might also exacerbate insecurity and inequality. As we step into the AI age, welfare programs which are associated only with stable, full-time employment may become increasingly insufficient. However, social protection needs to adjust to more flexible career paths, platform work and career transitions. Sustainable welfare in the age of AI is therefore not only a question of innovation but also of a reorientation of the understanding of labour rights and income security as well as the human significance of work. Technology must be used for the benefit of man, not to make man economically disposable.

AI and the Transformation of Social Welfare Systems

In addition to reshaping markets and workplaces, AI is impacting how welfare services are provided and managed. Welfare systems are intended to prevent poverty, disease, unemployment, disability and other situations of vulnerability, and also to foster human development in the fields of health, education and care (Rathore, 2024)^[14]. AI can enhance these systems to be more responsive, efficient and personalized. AI can help in healthcare, such as diagnostics, hospital resource management, disease surveillance and treatment planning. Within the educational domain, adaptive learning systems can be used to detect the need of the student, and adjust the content of the learning. AI can enhance benefit targeting, detect vulnerable households, and streamline administrative processes in social protection.

These advances are particularly relevant to nations with limited capacity to provide public services, with poor information systems or high demand pressures. AI can support governments in shifting from reactive to preventive welfare, by detecting risks in time and enhance the cooperation between institutions. For instance, predictive capabilities could be used to monitor disease outbreaks in public health, and data analytics could be used to better distribute food assistance or unemployment benefits. If that is the case, in principle, it could boost inclusion, cut down on inefficiencies, and enhance citizens' quality of life, especially of vulnerable groups.

However, welfare is not a technical system only, it is an ethical and political system, which is anchored in the principles of justice, rights and human dignity. Thus, there are substantial moral concerns regarding the use of AI in the Welfare management. When predictive systems are founded on incomplete or incorrect data, qualified individuals will be locked out, households will be misclassified or their existing disparities will be magnified. This may be opaque and render it more difficult to challenge, and leave vulnerable individuals under the mercy of opaque algorithmic decisions. Gender, class, language/region inequalities in

health care and education can be obtained with AI systems that have been trained on smaller data sets.

Thus, it is important to be cautious of the role of AI in welfare systems. Efficiency is great but should not be about a lack of transparency, accountability and inclusion. Human oversight in the decisions that affect the rights, access and personal well-being is an important need. AI must be used to support welfare practitioners and not to take the place of the ethical and empathetic decision-making. To make AI beneficial to human welfare, governments should invest in responsible data governance, appeals process, algorithmic audits, and inclusive digital access. When used in the right way, AI can become a potent weapon to support the welfare systems and reach more individuals. When it is not well managed, then it becomes a default disqualification and is likely to destroy confidence in social institutions. The challenge is to make sure that AI helps to make welfare a public good and not an impersonal exercise in administrative optimisation.

Environmental Sustainability and the Ecological Challenge of AI

The environmental factor cannot be underrated when it comes to sustainable development, and the image of AI is a complex one. AI, in its turn, delivers a set of effective environmental management and climate action tools (Haleem *et al.*, 2023)^[17]. It may aid in the optimization of energy consumption, the improvement of transport, smart grids, monitoring pollution, predicting extreme weather and improving to precision agriculture. AI-powered models can be used to analyse satellite data and detect deforestation, monitor biodiversity, and assess hazards. They could be applied in agriculture to aid in conserving water and fertilizers and increasing crop yield. These applications illustrate the potential of AI to play a crucial role in enhancing environmental sustainability, enabling societies to better manage their resources and respond to environmental challenges.

However, there is a material and environmental impact that comes with AI, which is often overlooked. Data centres, cooling facilities, electrical power and hardware are all essential to train and operate advanced AI systems. They require significant energy and water usage and if powered by fossil fuels, they are a source of carbon emissions. Digital hardware manufacturing also utilizes minerals, worldwide transport and manufacturing, producing waste and ecological stress. AI adoption is growing and so are its environmental impacts as long as digital infrastructure is not cleaner, more efficient and more circular.

It throws up a significant paradox. While AI can be a solution to address environmental issues, it can also exacerbate them if the energy and material requirements of AI are overlooked. Thus, sustainable growth in the AI age must not be overlooked, because not only 'AI for sustainability' but also 'sustainable AI' must be in focus. The former one is how AI can be used to create better environmental impacts, while the latter one is about minimizing the impact of AI itself. This involves creating more energy efficient models, raising awareness about energy consumption, meeting the energy needs of data centres with renewable energy and prolonging the lifespan of digital devices.

Environmental sustainability is closely linked to human well-being from a welfare point of view. These impacts of

climate instability, pollution, biodiversity loss, and resource depletion are all direct impacts on health, livelihoods, food security, and social resilience. AI can, of course, be used to grow the economy, but at the expense of ecology, which undermines the foundations of long-term welfare. For this reason, it is important to clearly outline a sustainability agenda when implementing AI, with a focus on low-carbon innovation and on resource efficiency and responsible use of digital infrastructure. It's not just about the efficiency, but about the efficiency within planetary limits. Then only is it able to help the sustainable growth.

Conclusion

Artificial Intelligence is transforming the face of technology, growth and welfare in the new paradigm. It has high potential to productivity gains, innovation, improved services to people and social and environmental concerns. The manufacturing, healthcare optimization, customization of the education process, better welfare provision, and more efficient management of the resources can be streamlined with the help of AI. These are possibilities that enable it to be a powerful force in the future of development. However, AI can also be quite perilous. It can affect the displacement of workers, increase inequality, concentrate economic power, increase surveillance and create new environmental pressures via digital infrastructure. To this end, the technical sophistication and market value of AI are not enough to assess it. It does make a difference whether it is inclusive, humane and ecologically sustainable development.

This paper has discussed the necessity to consider sustainable growth in the era of AI as multidimensional process. Not only should AI increase productivity or open up new business opportunities, but also it should improve human ability, develop social protection, and advance equitable labour movements and environmental limits. The distribution of the benefits of technological advancement and how vulnerable individuals are protected and the management of digital change by the public institutions will determine whether welfare will be attained in the AI age or not. AI itself is not emancipatory, it is not destructive. Its outcomes are a factor of political choices and ownership structures, values, and the institutions of democracy.

As a by-product, collective responsibility will become the future of sustainable development and well-being during the era of AI. Governments need to invest in education, digital inclusion, labour protection and responsible innovation. When companies are seeking to apply AI, they must take into consideration ethical aspect of fairness, transparency and environmental sustainability. Researchers and the civil society should continue to pose the question of who AI is to, and who is not represented. AI may turn into a tool of common good and social welfare when it is motivated by human-driven values. Unless it is given due regard to the wider social norms, it may augment the very inequalities and vulnerabilities it is meant to address. The problem of the AI age is not only technological, but moral and political how to ensure that machine intelligence serves the long-term good of people and the planet.

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