

A Visual Analysis of GenAI's Impact on Economic Development from a Risk Perspective - Booster or Spoiler

Yi Dong *

Department of International Economics and Trade, Capital University of Economics and Business,
Beijing, 100000, China

* Corresponding Author Email: 32022030207@cueb.edu.cn

Abstract. Cultivating new quality productive forces is the focus of the 20th National Congress of the Communist Party of China, representing the evolution direction of the advanced productive forces, and the qualitative state of the advanced productive forces that is born from the revolutionary breakthroughs in technology, the innovative allocation of production factors, and the in-depth transformation and upgrading of industries. In this direction, Generative Artificial Intelligence (GenAI) has undoubtedly achieved a subversive transformation of the world's science and technology. Many scholars have focused on the exploration of artificial intelligence (AI) in medical care, law, industrial development and even people's well-being. However, because of the difficulty of measurement, collection and analysis, economic development is often mentioned the least, but it has the closest relationship with human beings. Therefore, this paper compares the literature of AI with the development process of GenAI, and analyzes the selection and fitting of measurement indices such as economic development, AI coverage rate and business potential. The conclusion is that GenAI still has its disadvantages and defects, but it also has great overall benefits to China's economy, and thus promoting the growth of China's economy.

Keywords: GenAI, subversive transformation, new quality productive forces, industrial development.

1. Introduction

Generative Artificial Intelligence (GenAI) is an artificial intelligence technology that shifts from traditional analytical Artificial Intelligence (AI) to generative one, which focuses primarily on creation and generation, using complex algorithms, models, and rules to learn from large-scale data sets to create new and original content. After entering the 21st century, global artificial intelligence has set off a wave, and it has evolved from the ancient Eliza program and Stanford cart to ChatGPT and Sora generative AI in recent years.

Many researchers focus on the development of AI technology, AI ethics, and the business value of AI, but it is obvious that they cannot give reasonable revelation and analysis to today's advanced digital technologies. Based on this, this paper places GenAI for data processing and empirical attribution in the context of China's new quality productivity for the first time. National economic indicators are used to fit and compare GenAI's technology coverage and business potential indicators. Among them, the measurement index of material economic development is Gross Domestic Product (GDP) and the measurement index of non-material one is Human Development Index (HDI). Therefore, the relative dialectical relationship between the advantages and disadvantages of GenAI and economic development from the perspective of different industries is analyzed. Therefore, it can be inferred that the economic potential and economic value created by generative AI outweigh the negative economic impact, especially in the basic services and manufacturing industries.

2. Disruptive Transformation

2.1. AI in Different Industries

Looking back at China's overall industrial layout, agriculture is the source of the economy, meeting the daily food needs of the people. Therefore, scientific and technological progress in agriculture will certainly promote the sustainable development of a country. In the wave of digital economy, the

digitalization of agriculture has gradually become a fact, and China has developed from the simple embedding of electronic information technology to the use of artificial intelligence and other digital technologies to realize the precise development of digital agriculture [1].

At present, micro, small and medium-sized enterprises (MSMEs) occupy a large part of the Chinese market, accounting for almost 80%, and are the main driving force of China's economic development. Then, while growing and gaining dynamism, AI technology drove a round of manufacturing innovation. However, the technological limitations of manufacturing are also more obvious than those of agriculture, and even if MSMEs can become a competitive advantage for their leading position, they also fall short in terms of digital applications, financial capital, and strategic vision management [2, 3].

In the field of financial risk prediction and management (including Risk Management Model), enterprises need to make rational use of machine learning and deep learning to make behavioral decisions, carry out effective valuation and quantitative calculation. This is the most can reflect the generation of artificial intelligence irreplaceable and the necessity of the key evidence, but also an innovation in intelligence technology [4, 5].

2.2. Deep Learning Algorithms – Innovative Output

AI is a rich system, machine learning belongs to a subset of artificial intelligence, and deep learning is one of its branches, neural network plays a “Pillar” role in the algorithm system.

Deep Learning (also known as deep learning or differential programming) is a subset of a large class of machine learning algorithms designed to automatically learn, recognize, extract, expand, and predict specific objects and structures, without human intervention. The core structure of generative artificial intelligence is this kind of advanced algorithm. Thus, unlike the general “Robot”, the generated artificial intelligence is more like a bionic or intelligent Superman.

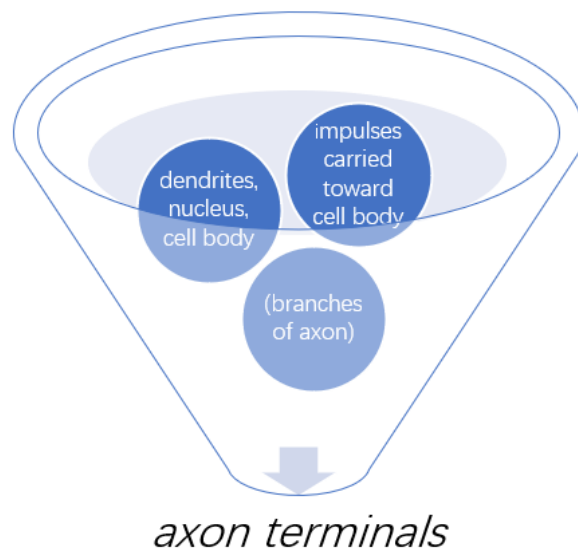


Figure 1. Biological neuron network

At the same time, part of the evolution of GenAI should focus on biological nervous systems. Part of its strength lies in its focus on creating a new way of thinking in the human brain, using built-in feedback systems to achieve biomimetics, or simulations. The principle of operation is shown in Figure 1.

In short, it combines some elements of parallel processing with self-learning mechanism to form a complete network system. However, the confusing part also needs to be emphasized that deep learning and neural networks, although closely related, are not identical in concept, because of three or more layers of neural networks can be considered as deep learning algorithm (different from the basic neural network) [6].

3. Economy and Investment Structure

From the perspective of the entire development process of AI, it has a far-reaching impact on economic and social development. Against this backdrop, the new changes and characteristics of China's economic and investment structure are particularly noteworthy. Figure 2 below maps China's GDP per capita data (from left to right) from 1990 to 2022 (from Cathay Pacific's CSMAR database). From Figure 2, GDP per capita data rises year by year, showing a good growth trend, reflecting China's economic level has improved significantly, which, in 2022, has reached 85,698.11 (US\$).

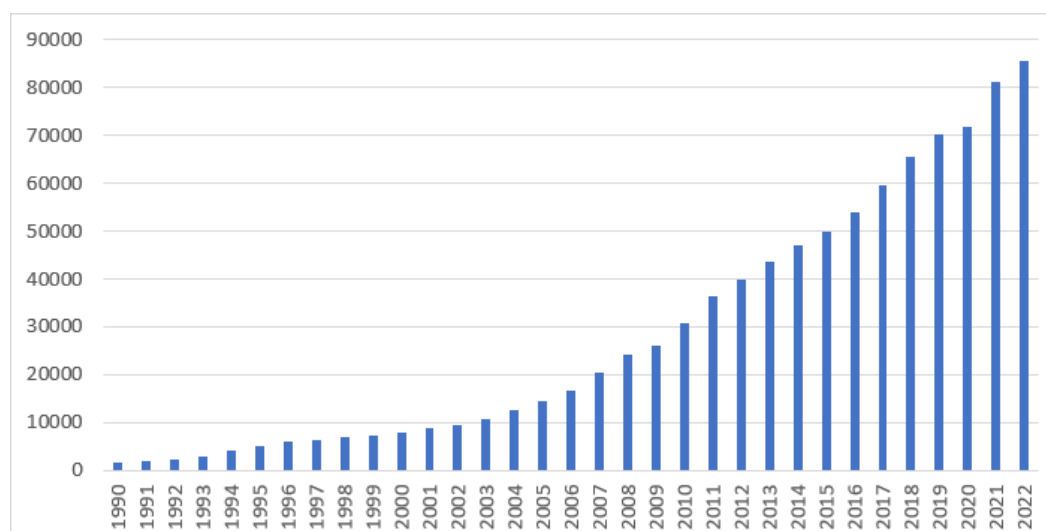


Figure 2. Changes and values of GDP per capita from 1990-2022

As seen in the figure, China's economy has maintained a steady growth trend in recent years, and its investment structure has been continuously optimized. The traditional manufacturing-led investment model is gradually developing in the direction of diversification and high quality. This transformation not only reflects the Chinese government's firm determination to transform and upgrade the economy, but also reflects the market's ardent expectations for emerging industries, scientific and technological innovation, and other fields.

Driven by GenAI, China's economy is ushering in a new cycle of technological innovation. The wide application of artificial intelligence technology not only improves production efficiency and reduces costs, but also gives birth to a series of emerging formats and business models. This has injected new vitality into China's economy and provided strong support for the optimization of the investment structure.

In terms of investment structure, China is gradually increasing its investment in scientific and technological innovation and green development. Scientific and technological innovation is the key force to promote economic transformation and upgrading, and green development is the only way to achieve sustainable development. By optimizing the investment structure, China is striving to build a modern economic system with innovation-driven and green development at its core.

Moreover, the Chinese Government has also actively promoted coordinated regional development and increased investment in the central and western regions. This will not only help narrow the regional development gap and promote balanced development across the country, but also provide more sources of impetus for economic growth.

Looking ahead, with the continuous development and application of GenAI technology, China's economic and investment structure will show a more diversified and high-quality development trend. At the same time, the government also needs to keep a clear head, recognizes the risks and challenges that may face in economic development, and takes measures to deal with and prevent them [7].

4. Economic Impacts

4.1. Economic Development

According to “McKinsey's Global AI research report”, the value potential is measured from two aspects: the total scale of potential gained by the organization after the deployment of GenAI and the impact of specific work tasks. The results of the report show that GenAI can unlock \$20,000 of potential value for China, and the largest proportion of benefits in the two major industries of advanced manufacturing, electronics and semiconductors, and the industry benefits.

Data related to the Human Development Index (HDI) is another powerful indicator of the dynamics of China's economic development. As a comprehensive indicator to measure the level of human development in a country or region, the changes of HDI not only reflect the achievements of social and economic development, but also indicate the possible development trend in the future. The recent positive changes in China's HDI data undoubtedly provide strong evidence for China's economic development.

As can be seen in Figure 3, from the overall trend of HDI, China has shown a steady upward trend in recent years, reaching 1.97 in 2022, which shows some factors that cannot be explained by per capita income, such as the Chinese government's efforts to improve people's living standards, promote education popularization, and improve medical and health conditions. China is also gradually transforming from a traditional manufacturing country to an innovative country, which has also injected new impetus into the improvement of HDI.

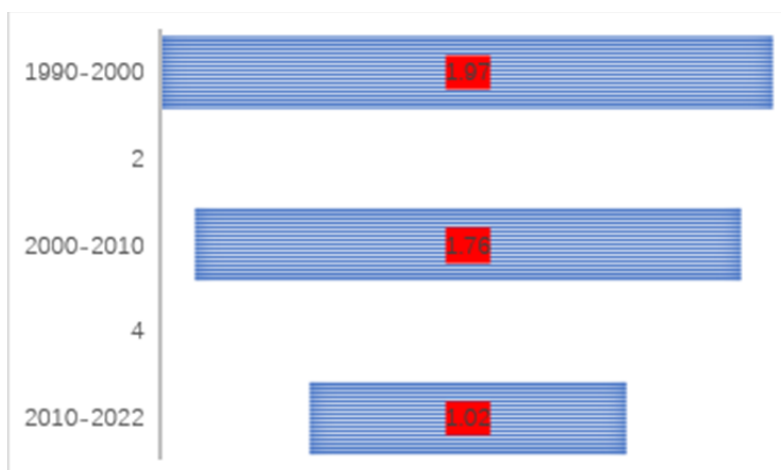


Figure 3. China HDI Index from 1990 to 2022

4.2. Employment

GenAI is having a profound impact on the job market. According to Forrester's 2030 Generative AI Jobs Impact Forecast, released by analytics firm Forrester, GenAI will eliminate 2.4 million jobs by 2030, but it will also reshape more than 11 million jobs. The numbers are shocking, but they also point to GenAI's potential impact on the job market [8].

The "excessive adoption" of GenAI will have a certain impact on the job market. Some jobs will be automated, putting some workers at risk of losing their jobs. According to a February survey by Resumebuilder.com, a quarter of companies have replaced employees with ChatGPT.

However, GenAI will not just replace jobs, it will also change the way other jobs are done. According to Forrester's estimates, automation and AI combined will displace 4.9 percent of jobs by 2030, with 30 percent of jobs lost, or about 2.4 million jobs. However, the changes in employment positions are very severe. This means that GenAI's impact on the job market will not simply be replacement, but will change the way jobs are done [9,10].

4.3. Resource Allocation

With the rapid development of generative AI technology, its application in resource allocation has gradually become a new driving force for China's economic development. Resource allocation is a crucial part of economic activities, which involves how resources are allocated, used and managed to maximize economic and social benefits. With the help of AI, the way and efficiency of resource allocation is undergoing profound changes.

Traditional resource allocation often relies on government planning and market regulation, both of which have their limitations. While government programs can ensure that resources are allocated in a certain direction and goals, they are often inflexible and adaptable, making it difficult to respond to rapidly changing market conditions. While flexible and efficient, market regulation can also lead to problems such as over-concentration, waste, and uneven distribution of resources [11].

The emergence of GenAI technology provides new solutions for resource allocation. Through big data analysis, machine learning and other technical means, AI can more accurately predict market demand and resource supply, and provide a scientific basis for decision-making. At the same time, AI can also optimize the algorithms and models of resource allocation, improving the efficiency and accuracy of resource allocation.

In China's economy, the application of GenAI in resource allocation has achieved remarkable results. In the financial sector, AI can provide financial institutions with more accurate credit assessment and risk management services by analyzing a large amount of financial data and market information, thereby optimizing the allocation of credit resources and reducing financial risks. In the manufacturing industry, AI can improve the utilization rate and production efficiency of raw materials and realize the rational allocation of resources through intelligent scheduling and optimization of production processes. In the field of agriculture, AI can intelligently adjust the planting plan according to soil, climate and other conditions through precision agriculture technology to achieve resource conservation and efficient utilization [12].

4.4. Potential Threats

GenAI is an amazing technology that has already made significant progress in many areas. However, as GenAI technology continues to evolve, it also raises some potential threats and issues. First, GenAI technology will perpetuate the ills of AI and may lead to mass job losses. Many repetitive tasks have been automated, just as the advent of Sora has hit those in the film and television media industry like never before, which means that many people may lose their jobs. While similar AI technologies will also create new job opportunities, they may face greater employment pressure for those who lack AI skills or education.

Second, GenAI technology may lead to the invasion of personal privacy. A whole system of deep algorithms requires a large amount of data to train and improve, which can involve sensitive information about individuals. If this information is used or leaked inappropriately, it will pose a serious threat to the privacy of individuals.

In addition, its decision-making process can become opaque and difficult to understand. This can lead to doubts about the decisions of the AI system and may even lead to unjust results. At the same time, as with AI technology, GenAI can be used for malicious purposes. For example, advanced technology is not limited to creating false information, cyber-attacks, or other forms of criminal activity, but also has led to ethical abuses.

Overall, while emerging technologies present many opportunities, it is crucial to recognize the potential threats they pose, and move them forward while ensuring their ethical and legal compliance to ensure the safety and sustainability of the exploding GenAI technology [13].

5. Conclusion

With the rapid development of science and technology, GenAI, as an emerging branch of AI, is increasingly becoming an important driving force for China's economic development. GenAI, with

its powerful data generation and processing capabilities, has injected new vitality into the innovation, efficiency improvement and sustainable development of China's economy. Based on the combination of the principles and algorithms of generative AI itself and China's economy (with GDP and HDI as the main panel data), this paper summarizes the following conclusions. First, GenAI plays a key role in driving innovation in China's economy. Innovation is the core driver of economic development, and GenAI provides powerful technical support for innovation. Through deep learning and big data analysis, it can mine valuable information hidden in massive amounts of data, providing accurate guidance for enterprise product development and market strategy formulation. At the same time, GenAI can also simulate the innovative thinking process of human beings, providing a steady stream of inspiration for scientific and technological innovation. This kind of technical support has enabled China's economy to make remarkable progress in innovation, promoting industrial upgrading and economic development.

Second, GenAI plays an important role in improving the efficiency of China's economy. Traditional economic activities are often plagued by problems such as information asymmetry and inefficient decision-making, while GenAI can significantly improve the efficiency of economic operations through automation and intelligence. For example, in the financial sector, GenAI can provide investors with accurate investment recommendations and reduce investment risks by analyzing large amounts of financial data. In manufacturing, GenAI can optimize production processes, improve production efficiency, and reduce production costs. This efficiency improvement not only helps enterprises improve their competitiveness, but also helps to promote the healthy development of the entire economic system. In addition, GenAI is also of great significance for the sustainable development of China's economy, that it can provide technical support for sustainable development by optimizing resource allocation and improving energy efficiency. For example, in the field of energy, GenAI can analyze energy consumption data and propose effective solutions for energy conservation and emission reduction, and in the field of environmental protection, generative AI can monitor environmental pollution and provide a scientific basis for pollution control. The application of these technologies will help drive China's economy towards a greener and more low-carbon direction.

There are two biggest drawbacks in this study. First, because the research object is contemporary cutting-edge technology, the official and effective literature and data are scarce, and it is difficult to collect, which will lead to incomplete analysis results to a certain extent. Second, the panel data fitted in this paper is limited, and further detailed work is needed if accurate quantitative results are required.

However, it worth notice that GenAI is also facing some challenges and problems while promoting China's economic development. For example, data security and privacy protection issues, technical standards, and regulatory gaps all require strengthening research and response. Therefore, in the process of promoting the development of GenAI, attention needs to be paid to the coordinated development of technological innovation and regulatory norms to ensure the healthy development of technology and benefit the whole society.

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