The impact of artificial intelligence technology innovation on economic development -- from the perspective of generative AI products

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Abstract. The new generation of artificial intelligence products, represented by ChatGPT and Wenyan Yixin, is rapidly and extensively integrating into human production and life at an unprecedented pace, breadth, and depth. Generative artificial intelligence possesses distinct characteristics and functionalities compared to rule-based artificial intelligence, exerting a more prominent dual impact on the high-quality development of China's economy. On the one hand, it can promote high-quality economic development through empowering effects such as innovation-driven effects, enhanced production efficiency, and industrial transformation and upgrading effects. On the other hand, it may give rise to deep-seated risks, including labor market disruptions, market monopolization issues, national security risks, and misinformation phenomena, which could hinder high-quality economic development. It is crucial to have a correct understanding and a scientific approach, leveraging its positive effects while proactively addressing negative impacts, guiding it to better serve the needs of China's high-quality economic development..

Keywords: ChatGPT, Generative artificial intelligence, the high-quality development.

1. Introduction

The world development history since the Industrial Revolution indicates that each significant technological revolution profoundly alters the global landscape and presents historical opportunities for the rise of major powers [1]. In the 1860s, during the first Industrial Revolution, the invention and application of the steam engine, representing technological innovation, generated enormous productivity, propelling Britain to become the world's most powerful nation. In the first half of the 20th century, the Second Industrial Revolution ushered humanity into the "electrical age," with the United States, Germany, and the Soviet Union emerging as new industrial powerhouses. Around the 1970s, the onset of the electronic and information revolution saw the United States solidify its position as a superpower, dominating the international economic and trade order due to its advantage in the field of information technology[2]. Currently, a new round of technological revolution is rapidly advancing, and countries worldwide are actively vying for dominance in cutting-edge fields such as big data and artificial intelligence. At the end of 2022, the emergence of the large-scale language model ChatGPT (Chat Generative Pre-trained Transformer), developed by OpenAI, propelled global artificial intelligence technology into a new era. As a foundational technology of the digital age, artificial intelligence, through the utilization of artificial neural networks to simulate the inherent logic of human thought and action, has achieved a profound development in the essence of human intelligence. It is hailed as the gem on the crown of digital technology[3].

ChatGPT's display of disruptive and innovative technology is regarded as a significant milestone in the history of artificial intelligence, signaling the transition into the era of content-generative capabilities. Due to its remarkable understanding of natural language and content generation abilities, ChatGPT can handle complex scenarios much like a "real human." In March 2023, Baidu promptly followed suit by officially launching China's first knowledge-enhanced large language model, the generative artificial intelligence product Wenyan Yixin[4]. It can be applied in various scenarios such as literary creation, business copywriting, mathematical reasoning, Chinese comprehension, and multimodal generation. The new generation of artificial intelligence technology is integrating into human society more rapidly, comprehensively, and on multiple levels. It is profoundly changing

human production and lifestyle, exerting a significant impact on economic development. China has transitioned from a high-speed growth phase to a high-quality development phase and is at a critical period of initiating comprehensive construction for a socialist modernization drive[5]. The ability to grasp the opportunities and challenges brought by new technological changes such as ChatGPT and Wenyan Yixin is crucial for the smooth advancement of the Chinese-style modernization and the timely realization of high-quality development goals. This article intends to examine the characteristics and functionalities of generative artificial intelligence such as ChatGPT, analyze its empowering effects on high-quality economic development, explore potential risks associated with such technological changes, and propose corresponding strategic suggestions based on the dual impact of ChatGPT and similar technologies on China's high-quality economic development[6].

2. Features and functions of generative artificial intelligence such as ChatGPT

In the 1940s, with advancements in scientific research such as early neural networks and digital signals, interdisciplinary studies collectively laid the groundwork for the possibility of constructing an electronic brain. Cybernetics connected various fields like engineering, neuroscience, and biology, and the invention of programmable digital computers significantly increased the feasibility of realizing an electronic brain, marking the beginning of early artificial intelligence research. In 2012, the generative artificial intelligence model AlexNet was introduced, and in 2017, the Google Brain team proposed the Transformer architecture, continuously expanding model parameters. The birth of ChatGPT in 2022 signifies the maturation of generative artificial intelligence technology. ChatGPT, short for "Chat Generative Pre-trained Transformer," is an interactive application developed by the American company OpenAI, based on a large language model. As a generative artificial intelligence technology, ChatGPT relies on the Transformer architecture and utilizes neural network algorithms to capture relationships between language characters, recognizing various task information. It generates the desired content for users by adjusting input and output language types. Unlike static databases and corpora, ChatGPT possesses powerful content generation and interactive capabilities[7]. Each conversation and interaction with users allows the model parameters to learn, debug, and grow, optimizing the output content for the next interaction. ChatGPT continuously perceives changes in user "demands" through its unique algorithmic advantages. More conversations and complex requests contribute to the optimization of performance. In just six months since its inception, ChatGPT has evolved to its fourth generation, achieving significant performance improvements compared to the first generation, as shown in Table 1.

Table 1. Performance variation and iteration characteristics of ChatGPT

Name	Performance characteristic
ChatGPT 1.0	The weight parameters are updated according to the specific task data, and the large language model is supervised and fine-tuned according to the classical natural language model on the basis of unsupervised training
ChatGPT 2.0	Complete supervised language tasks through unsupervised training, and continuously expand parameters and data scale during training
ChatGPT 3.0	Change the way of processing without examples, provide a small amount of example guidance in the training process, and increase the adaptability of the model to different language tasks
ChatGPT 3.5	Add the user feedback mechanism of question and answer performance, and give the reward value of task differentiation according to the prompts of different language tasks to guide the feedback reinforcement model, and increase the humanization performance of the model in multilingual task processing
ChatGPT 4.0	The image input function is added to realize the communication from language to multi-mode, support the completion of various "image-language" tasks, and enhance the language ability of the model by using image data

Early artificial intelligence technology primarily involved static analysis of datasets and corpora, assisting humans in decision-making and judgment in specific tasks such as machine translation, facial recognition, and autonomous driving[8]. With the development of related technologies such as neural networks, big data, and deep learning, the field of artificial intelligence has undergone a breakthrough from rule-based AI to generative AI. Supported by underlying algorithms and training mechanisms, ChatGPT possesses knowledge transfer capabilities, enabling it to generate logical conversational text in all knowledge domains and exhibiting powerful functionality in adapting to complex tasks and human-machine interactions. Leveraging big data and neural network algorithms, ChatGPT not only engages in interactive conversations with users but also identifies complex task information, independently performs tasks such as text composition, data organization, and program writing. This marks a milestone in propelling artificial intelligence technology toward widespread use[9]. Currently, generative AI tools find applications in various fields such as writing, programming, drawing, and research. For example, OpenAI's Dall-E2 and Stability AI's Stable Diffusion excel in artistic creation, generating high-quality images and artworks based on text prompts. Notion AI is adept at various writing tasks, recommending materials, categorizing documents, and automatically responding to enhance the quality and accuracy of articles. Impression AI, developed by Evernote based on its lightweight large language model, Elephant GPT, offers intelligent analysis and processing services in multiple scenarios related to work, study, and daily life. Baidu's Wenyan Yixin product, capable of multimodal generation of text, images, music, and videos, has applications in intelligent office, programming, education, and more[10]. Through active participation in human knowledge and experience, forming an interactive connection between human experience and artificial intelligence neural networks, generative AI models like ChatGPT can better serve the development of human society.

Generative artificial intelligence technologies like ChatGPT align with the characteristics of general-purpose technologies, namely universality, progressiveness, and innovation-fostering nature. Universality is reflected in ChatGPT's broad applicability across various domains in both industrial and consumer contexts. Users can guide the pre-trained model to generate desired content information through prompts[11]. Progressiveness is evident in the continuous optimization capabilities of ChatGPT's algorithmic model. It can adapt to complex task scenarios and, to a significant extent, replace human cognitive work. Innovation-fostering nature is demonstrated as ChatGPT contributes to the promotion of innovative applications, enhancing the research and development efficiency in various sectors and accelerating the pace of technological innovation across society. In addition to the characteristics inherited from the previous generations of general-purpose technologies like computers and the internet, generative AI technologies such as ChatGPT exhibit unique features including sociability, interactivity, and multimodality, signaling a new paradigm for artificial intelligence as a general-purpose technology. Generative AI has the potential to liberate repetitive cognitive tasks and mechanical industrial systems. It can be embedded in diverse software, programs, and tools, widely applied across industries, occupations, positions, and scenarios. Generative AI is not limited to design-oriented industries like media, consulting, advertising, entertainment, and gaming. It can also find applications in content-oriented sectors such as healthcare, finance, and manufacturing, as well as technical industries. Its expansive development space and significant impact potential are evident. Taking the example of biopharmaceuticals, companies like Insilico Medicine input information on drug targets and compound structures from scientific literature into artificial intelligence drug development platforms. These platforms, through machine learning, autonomously discover drug targets, design and synthesize small-molecule compounds, resulting in drugs that exhibit greater creativity in molecular structure compared to those designed by researchers.

Breakthroughs in key technologies have the potential to revolutionize human production and lifestyles, ushering in profound economic and social transformations. Since the Industrial Revolution, mechanization, electrification, and informatization have successfully driven economic transformation and social development. The iterative evolution of generative artificial intelligence is poised to become a pivotal opportunity for propelling humanity toward a brighter future. As we enter the phase

of high-quality development, it is imperative to uphold a scientific and objective development philosophy, balancing the speed and quality of development, and consistently making the realization of people's aspirations for a better life the starting point, foothold, and focus of development. On the one hand, there is a need to further consolidate the material foundation of economic development, cultivate higher-quality human capital, and advance technological innovation to comprehensively enhance productivity, ensuring steady and rational economic growth[12]. On the other hand, adhering to the new development concept, particularly considering the overall, global, balanced nature of development, is crucial. It is essential to strike a balance between inclusiveness, harmony, and equilibrium to address the contradictions between the growing aspirations for a better life in the new era and the imbalances and inadequacies in development. As generative artificial intelligence technology continues to mature, it can drive the rapid and continuous iteration of products, permeating and applying across various sectors of economic and social activities. With the widespread use of new-generation artificial intelligence products, technologies like ChatGPT are becoming more intricately linked with economic and social aspects, playing a significant role in driving disruptive changes across various fields while contributing significantly to high-quality economic development[13]. Leveraging the self-updating and iterative capabilities of generative artificial intelligence technology, global economic development is poised to enter a new mode based on AI content production and characterized by self-organizing information. More and more people can explore and apply a broader range of possibilities with the assistance of new-generation AI tools like ChatGPT. Moreover, the development of generative AI technologies like ChatGPT will spawn new application scenarios, business logics, and industrial paradigms, propelling the development of the digital economy, altering production relationships and value creation methods, and even potentially restructuring the global business order and industrial structure. It is crucial to fully recognize both the opportunities and challenges brought about by the development of generative AI technologies represented by ChatGPT, refine policy guidance and governance measures to effectively support and promote high-quality economic development.

3. The empowering effect of generative artificial intelligence such as ChatGPT on high-quality economic development in China

Unlike rule-based artificial intelligence, generative AI represented by ChatGPT possesses powerful content generation and human-machine interaction capabilities, playing a crucial role in unleashing innovative potential. Leveraging its rapid iteration capability and the universal characteristics as a foundational technology, ChatGPT has a disruptive impact on changing production methods, unleashing production capabilities, and adjusting production relationships. In the phase of high-quality development, relying on the traditional input-driven approach for economic growth is unsustainable. Addressing the critical issue facing China involves consolidating the foundation of economic growth and promoting the transformation of growth drivers. To facilitate a smooth transition to high-quality development, it is essential to fully explore growth potential, enhance productivity, and transform the development mode. Firstly, there is a need to vigorously promote the strategy of innovation-driven development, increasing total-factor productivity by unlocking new dynamics through improved independent innovation capabilities and breakthroughs in key technologies. Secondly, breaking down current barriers to factor mobility, improving factor allocation efficiency, and overcoming resource constraints and growth limits under traditional production relations are necessary to boost economic efficiency. Thirdly, building upon improved economic efficiency and transformed development modes, reinforcing industrial specialization and collaboration, restructuring industry patterns and organizational forms, and promoting advanced and rational development of the industrial structure are crucial for laying the foundation of the "dual circulation" new development paradigm. Generative AI technologies like ChatGPT can actively contribute to China's high-quality economic development through the innovation-driven effect, enhanced production efficiency effect, and industrial transformation and upgrading effect.

3.1. The innovation-driven effect of ChatGPT

Generative artificial intelligence technologies like ChatGPT are poised to trigger a paradigm shift in the landscape of technological innovation, providing intrinsic impetus for China's technological leapfrogging and high-quality economic development. The iterative development of ChatGPT not only signifies an acceleration of technological updates in the field of artificial intelligence but, more importantly, can drive a transformation in scenarios and paradigms across the entire spectrum of technological innovation, significantly boosting the speed of technological innovation. Innovation activities fundamentally involve discovering possible combinations of elements within given technological constraints to achieve higher output at the same cost. The mechanism behind this realization lies in continuous trial and error, where more trial opportunities mean a greater likelihood of discovering new technologies. In the early stages of technological innovation, trial and error relied heavily on experience, with a low success rate and high trial costs[14]. With the deepening of scientific research and the standardization of research methods, the transformation in the field of technological innovation is primarily achieved through controlled experiments in laboratories, greatly enhancing the scientific nature of innovation activities and the efficiency of technological innovation. As generative artificial intelligence develops, the possibility of using machine algorithms for scientific exploration becomes feasible, and humans are no longer the sole agents of technological innovation. Machine algorithms can not only assist humans in enhancing research capabilities but can also achieve the recombination of knowledge elements at a lower cost and with higher efficiency. They can autonomously conduct research exploration and spontaneously expand the boundaries of research. Next-generation technologies like ChatGPT, with their intelligent, efficient, interactive information integration, processing, and generation capabilities, as well as lower trial and error costs, will alter the traditional paradigm of technological innovation[15]. This will further accelerate the speed of technological innovation, enhance efficiency, unearth the potential of technological innovation, and unleash the driving force of innovation for high-quality economic development.

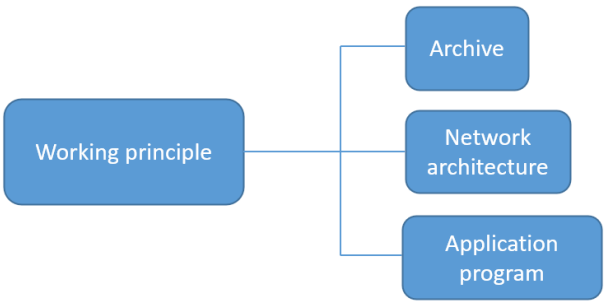


Figure 1 Basic architecture of chatgpt

3.2. Productivity gains from ChatGPT

In the era of the digital economy, data emerges as a crucial generative element in production activities, and the efficient utilization of data resources becomes key to enhancing productivity. As ChatGPT gradually achieves widespread application, the powerful information retrieval and content generation capabilities of generative artificial intelligence will expedite the accumulation, transformation, and utilization of data elements. Leveraging generative AI platforms, data elements can permeate the process of content innovation, breaking the temporal and spatial constraints of combining data elements with traditional factors. Simultaneously, it aids businesses in extending their industrial chains and achieving cross-industry development. Data elements can overcome the limitations of diminishing marginal returns associated with traditional production factors, thereby improving production efficiency and driving the outward shift of the efficiency curve. Through the utilization of new-generation artificial intelligence technologies like ChatGPT, the full potential of the digital dividend can be realized, unlocking the significant value of data as a production element. Furthermore, China's economic development has long been plagued by issues of factor market segmentation, leading to mismatches of factors between regions and industries. The development of

generative artificial intelligence can assist businesses in better identifying decision-making information in economic activities, enhancing information transmission efficiency, optimizing production resource allocation, and overcoming spatial constraints. This, in turn, alleviates factor mismatches resulting from information asymmetry and coordination failures, promoting an overall improvement in efficiency levels. In summary, with the support of generative AI technologies like ChatGPT, production activities can transcend traditional resource constraints and growth limits, facilitating efficiency-driven high-quality development[16].

3.3. Industrial transformation and upgrading effect brought by ChatGPT

The development of new-generation artificial intelligence technologies like ChatGPT is triggering transformations in industrial organizational forms and adjustments in industrial structures. The iterative evolution of generative artificial intelligence, in collaboration with digitized technologies such as the Internet of Things (IoT) and big data, is driving industrial revolution and exerting profound influences on economic development. As tools with characteristics of informatization, intelligence, and automation, products like ChatGPT are expected to comprehensively empower various fields through diverse platforms, facilitating integrated development and promoting a qualitative leap in digital technological productivity[17]. Generative artificial intelligence technologies can accelerate the transformation of industrial organizational platforms into digital, networked entities. By driving the formation of industrial organizational models centered around Internet platforms, these technologies facilitate the effective mobilization of factor resources across regions and industries. The application of generative artificial intelligence technologies will significantly reduce the operational costs of platform-based organizations, enhancing the value creation and aggregation functions of platform-centric industrial organizations. This, in turn, promotes a shift in industrial organizational relationships from linear competition to ecosystem collaboration. Moreover, tools like ChatGPT, possessing powerful interactive capabilities to support businesses in promptly understanding user demands, optimizing service processes, and enhancing product offerings, contribute to the formation of more efficient organizational structures and more integrated solutions. This fosters the continuous development of new formats and business models.

4. ChatGPT and others generate deep risks caused by artificial intelligence to the high-quality development of China's economy

4.1. Labour market shocks caused by ChatGPT

Generative artificial intelligence technologies like ChatGPT demonstrate unprecedented capabilities, transforming existing modes of production and significantly impacting employment and income distribution. Unlike previous rule-based artificial intelligence, ChatGPT not only replaces simple repetitive mechanical labor but, due to its strong capacity for automatic input, autonomous learning, and spontaneous output, may bring about a new wave of disruption to the labor market. The information output of generative AI, including ChatGPT, relies on existing datasets and corpora. When specific social groups cannot input data or face insufficient data input, they may be inherently excluded from the digital space due to the incompleteness of "big datasets." In this context, the application of ChatGPT may exacerbate income and opportunity imbalances in the labor market, leading to a continuous shift towards a technology-biased labor market. As generative artificial intelligence matures and permeates into other industries, industrial automation and robotics will reach a new level[18]. In the future, not only may employment positions in the industrial sector be largely replaced by machines embedded with new-generation AI technologies, but traditional service industries such as customer service, guiding, and translation also face significant employment challenges with the development of technologies like ChatGPT. According to a McKinsey report, it is estimated that by 2055, automatable jobs in the global economy, involving around 1.1 billion employees and $11.9 trillion in wages, will be most affected in roles characterized by repetitiveness,

predominantly found in manufacturing, catering, and retail. Generative AI technologies, including ChatGPT, will bring structural shocks to the labor market, leading to labor market friction, reduced efficiency in labor factor allocation, and exacerbation of challenges in achieving coordinated, shared goals, impacting the high-quality development of the economy.

Figure 2 shows the development process of generative artificial intelligence

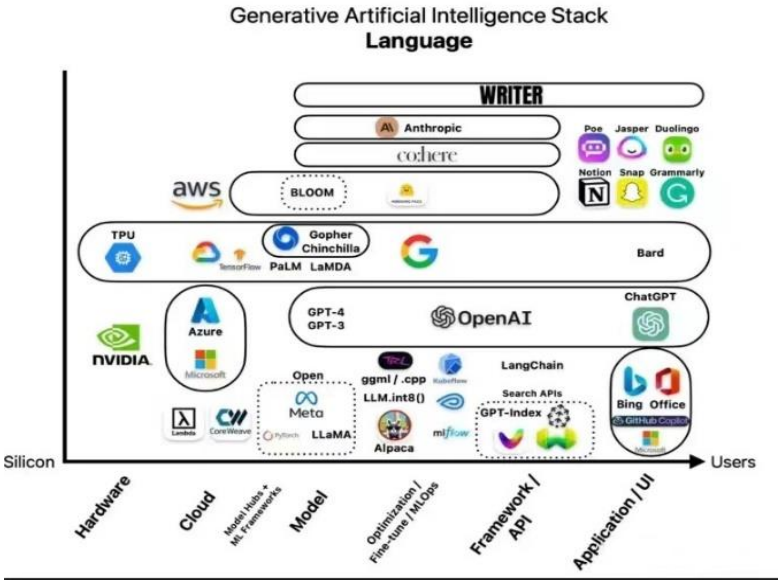


Figure 2 Generative AI technology stack

4.2. Market monopoly caused by ChatGPT

Generative artificial intelligence technologies like ChatGPT represent a disruptive technological revolution with characteristics of substantial upfront investment and high risk. Due to the need for significant resources and the undertaking of high exploration costs, such research and development activities are often only feasible for a few well-established large enterprises or technology companies supported by industry giants. Once the technology matures, these enterprises naturally gain market monopolistic power. Driven by the maximization of their own interests, companies possessing next-generation AI technologies may use their market influence to exclude potential competitors and disrupt the healthy competitive order of the market. For example, OpenAI, the company behind the development and operation of ChatGPT, achieved the breakthrough in generative AI technology primarily due to substantial investments from Microsoft, multiple rounds of financing, and the acquisition of small specialized technology firms as the foundation. After the launch of ChatGPT, OpenAI significantly lowered the API access prices, a strategy not only based on reduced operating costs but also aimed at restricting potential competitors through low pricing. With a lack of competitive pressure, the quality of products and services from monopolistic enterprises may decline, while the pricing of these products and services continues to rise. Moreover, as generative AI technologies like ChatGPT serve as "technological foundations" applicable across various domains, the formation of monopolistic power increases societal costs and decreases overall economic efficiency. Without effective regulation, the immense dividends brought about by new technology development could be monopolized by large enterprises, limiting the opportunities for new tech companies to participate in competition and independently survive. This not only hinders the widespread diffusion of new technological achievements across society but also exacerbates the unfair distribution of the outcomes of new technology development, suppressing the positive role of generative AI like ChatGPT in promoting high-quality economic development.

4.3. National security risks posed by ChatGPT

As ChatGPT and similar technologies continue to evolve, their characteristics of high intelligence and strong interactivity become increasingly apparent, exhibiting a trend of replacing decision-

making in many domains. The decision outcomes of these generative AI systems imply machine intent and the underlying commercial interests of the algorithms, which may lead to individual judgments and decisions being influenced by the algorithm's value orientation. Despite efforts during development to avoid biased conclusions, the issue of algorithmic discrimination remains significant in the underlying technologies of ChatGPT, controlled by large technology conglomerates. While attempts are made to mitigate bias in the generation of conclusions, the algorithms of most generative AI systems are built on Western value systems and ideologies. Moreover, designers, under the cover of the "algorithmic black box," may embed Western values into the coding design. This raises concerns about generative AI tools like ChatGPT becoming tools for the infiltration of Western ideologies, with the United States being a representative example. It is crucial to note that the servers of tools like ChatGPT are mostly located overseas, and the management and use of data must comply with the laws, regulations, and business norms of the hosting countries. Due to complex cross-border data issues, effective regulation and timely feedback on the use of generative AI tools like ChatGPT may be challenging, posing potential threats to the stable development of the Chinese economy and national security.

5. ChatGPT and other generative artificial intelligence to promote high-quality economic development countermeasures and suggestions

5.1. Give full play to the empowering effect of generative artificial intelligence such as ChatGPT to stimulate positive effects

To accelerate research, application, and promotion in related fields, and to fully leverage the empowering effects of generative artificial intelligence technologies such as ChatGPT, it is essential to unleash their positive impact on promoting high-quality economic development in China. First, fully exploit the advantages of ChatGPT and similar generative AI technologies in reducing innovation risks, enhancing innovation efficiency, accelerating innovation speed, lowering innovation thresholds, and improving innovation quality. Actively explore the vast application scenarios of ChatGPT in the domestic market, combining research, application, and optimization, to harness the significant role of generative AI in the innovation domain. Facilitate the enhancement of enterprise innovation capabilities by promoting ChatGPT and other generative AI technologies through technical assistance, data support, and intelligent empowerment. Speed up technology diffusion and support for the real economy, making generative AI a driving force for high-quality economic development. Second, consistently unlock the role of ChatGPT and similar generative AI technologies in promoting the efficiency of data factor allocation, continuously improving production efficiency. Through rational layout and application of generative AI technology, continually establish and improve data factor markets to achieve efficient utilization of data resources. Encourage ChatGPT and other generative AI technologies to better provide data and decision support, propel the digital transformation of enterprises, and enhance production efficiency, realizing efficiency-driven high-quality development. Third, actively harness the capabilities of generative AI technologies such as ChatGPT in accelerating the transformation of industrial intelligence, fostering the development of emerging industries, and elevating service levels and organizational change.

5.2. Effectively address the deep risks of generative AI such as ChatGPT and prevent adverse effects

It is essential to pay attention to the profound risks brought about by generative artificial intelligence and expedite the establishment of sound institutional rules and policy measures to prevent adverse impacts on high-quality economic development posed by technologies like ChatGPT. First, focus on the disruptive impact of generative AI technologies such as ChatGPT on the labor market, emphasizing the industrial transformation and economic transition triggered by AI development. Intensify vocational training efforts and implement relevant employment support policies to enhance

the occupational skills of vulnerable groups in the digital era. Promote the advanced and rational development of industries while effectively addressing the widening income distribution gap caused by the development of generative AI. Mitigate the impact on the labor market and ensure high-quality economic development. Simultaneously, actively build infrastructure, reduce the "digital divide," lower the threshold and application costs of ChatGPT, and facilitate various groups' participation in algorithm debugging. Open channels to minimize data gaps and issues induced by embedded algorithms. Second, strengthen market supervision and anti-monopoly efforts to curb the influence of large corporate entities or prevent them from co-opting or eroding interests. Prevent technology giants that control new-generation AI technologies and large-scale machine algorithm models from forming monopolies that disrupt market competition rules and hinder innovation in small and medium-sized enterprises. Optimize regulatory measures and methods, advocate for a positive and healthy business culture, encourage stakeholders to voluntarily participate in the supervision and feedback process of generative AI applications. Foster a favorable market environment for high-quality economic development in China against the backdrop of the rise of ChatGPT.

6. Conclusions

Achieving high-quality economic development is a strategic goal and inevitable requirement for China's new development stage. The rise of new-generation artificial intelligence, such as ChatGPT, not only possesses autonomy, intelligence, universality, and advancement inherent to general-purpose AI tools but also features unique interactivity and multimodality. This technology revolution significantly impacts the underlying logic and development trajectory of China's economy. This study, set against the backdrop of the emergence of generative AI like ChatGPT, focuses on the characteristics and functions of new-generation AI. It analyzes the dual impact of this technological transformation on high-quality economic development in China. On the one hand, the study explores the empowering effects of ChatGPT in supporting innovation-driven development, promoting enhanced production efficiency, and driving industrial transformation and upgrading. On the other hand, it analyzes potential deep-seated risks associated with ChatGPT, such as labor market disruptions, increased market monopolies, national security concerns, and issues related to information distortion. The study concludes by proposing recommendations for seizing the opportunity presented by the rapid development of new-generation AI, emphasizing the acceleration of technological research and widespread application. Simultaneously, it underscores the need to leverage the positive effects while safeguarding against negative impacts. The study suggests implementing comprehensive measures to guide generative AI in better serving high-quality economic development and addressing associated challenges.

References

[1] B. Tan, and R. Liu, “The theoretical logic and structural elements of the construction of digital government -- based on the practice and exploration of Shanghai's “One-Netcom Office”,” E-government, no. 8, pp. 64-65, 2020.

[2] S. Wang, and Q. Zhang, “Opportunities and challenges brought by ChatGPT to researchers,” Library Forum, no. 4, pp. 115-120, 2023.

[3] Y. Cao, “The main body, procedure and method optimization in the construction of science and technology ethical review system,” Scientific and Technological Progress, no. 6, pp. 121-123, 2023.

[4] BERNERS-LEE T, “The semantic web,” Scientific American, vol. 284, no. 5, pp. 34-43, 2020.

[5] H. Xie, Z. Qin, and G. Li, “Deep learning enabled semantic communication systems,” IEEE Transactions on Signal Processing, no. 69, pp. 2663-2675, 2021.

[6] W. Shi, J. Cao, and Q. Zhang, et al, “Edge computing: vision and challenges,” IEEE Intermet of Things Journal, vol. 3, no. 5, pp. 637-646, 2016.

[7] WOOD G, “Ethereum: a secure decentralised generalised transaction ledger,” Ethereum Project Yellow Paper, no. 151, pp. 1-32, 2020.

[8] GOODFOLLOW I, POUGET – ABADIE J, and MIRZA M, “Generative adverbial nets,” Neural Information Processing Systems, vol. 3, no. 8, pp. 2672-2680, 2021.

[9] RONNEBERGER O, FISCHER P, and BROX T, “Net: Convolutional networks for biomedical image segmention,” Proceedings of the Medical Image Computing and Computer Assisted Intervention, vol. 8, no. 10, pp. 234-241, 2019.

[10] Z. Yan, X. Li, and M. Li, “Shift-net: Image inpainting via deep feature rearrangement,” Computer Vision-ECCV, vol. 17, no. 20, pp.30-37, 2018.

[11] J. Hu, L. Shen, and ALBANIE S, “Squeez-and-excitation networks,” IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 42, no. 8, pp. 2011-2023, 2020.

[12] K. Wang, C. Gou, and Y. Duan, “Generative adversarial networks: the state of the art and beyond,” Acta Automatica Sinica, vol. 43, no. 3, pp. 321-332, 2017.

[13] RONNEBERGER O, FISCHER P, “U-Net: Convolutional Networks for Biomedical Image Segmentation,” Medical Image Computing and Computer-Assisted Intervention, vol. 20, no.15, pp. 234-241, 2015.

[14] HOOCHANG, ROTH H R, and GAO M, “Deep convolutional neural networks for computer-aided detection:CNN architectures, dataset characteristics and transfer learning,”,IEEE Transactions on Medical Imaging, vol. 35, no. 5, pp.1285-1298, 2016.

[15] J. Zhu, J. Wang, and B. Wang, “Improved lightweight mask detection algorithm based on YOLOv4-tiny,” Chinese Journal of Liquid Crystals and Displays, vol. 36, no. 11, pp. 1525-1534, 2021.

[16] Adomavicius G, and Tuzhilin A, “Toward the Next Generation of Recommender Sestems: A Survey of the State-of-the-Art and Possible Extensions,” IEEE Transactions on Knowledge and Data Engineering, vol. 17, no 6, pp. 734-749, 2020.

[17] Hariri N, Mobasher B, and Burke R, “Using social tags to infer context in hybrid music recommendation,” vol. 41, no. 5, pp. 20-23, 2019.

[18] Q. Ren, “Design and implementation of teaching system based on cloud computing,” Computer Knowledge and Technology, vol. 11, no. 30, pp. 109-110, 2015.