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AI Technology Revolution: Evolution, Impact and Countermeasures

Chen Long, Liu Gang, Qi Yudong, Chen Dingding, Shen Weixing, Zhang Shihua and Wen Baihua 9

The revolutionary breakthroughs in artificial intelligence (AI) technology over the past decade are the favorable outcomes of the effective integration of technology, industry and finance. These breakthroughs have been founded on the efficient collaboration of multiple market forces, where technological leadership, product competitiveness and venture capital returns have combined to form a robust positive feedback loop, thereby effectively addressing the substantial risks inherent in technological revolutions. The positive feedback and complementary innovation of AI industrialization and industrial intelligence departments not only are the essential driving force for the development of the AI industry, but also create conditions for the development of strategic emerging and future industries. Based on the law of accelerating returns in AI, the next few decades may usher in its “economic singularity”. The AI-centered digital economy may have a greater job creation effect than the substitution effect in general, but the impact on different groups of people will be different. And AI featuring deep learning has also greatly enhanced the depth, scope and potential of scientific discovery. However, driven by the differentiated AI capabilities of different countries and fierce major-country competition, new trends have emerged in the international political and economic fields, such as the gradual emergence of the two-pole competitive landscape, intensifying gaming among different groups and camps, and international economic cooperation suffering from setbacks. The US’ geostrategic competition with China coincides with surpassing the singularity point by smart technologies at a historic juncture, which has intensified extreme strategic competition among countries and pushed forward the fundamental evolution of war patterns. Intelligent competition has become the focus of national security, and intelligent instruments empower extreme strategic competition. In the process of AI development, it is necessary to not only use legislation to remove obstacles to AI technology innovation and application, but also deal with risks that arise in the application process of AI systems through legislation. It is necessary to fully understand the subtle differences between necessary regulation and excessive regulation, and adjust and update regulatory contents and forms in accordance with technological development and social changes.

International Governance of AI: Analysis Based on Technical Characteristics and Issue Attributes

Xue Lan and Zhao Jing

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The advancement of artificial intelligence (AI) introduces new uncertainties to global socioeconomic development, prompting a critical juncture in international governance of AI. The widespread adoption of Generative AI in commercial applications has drawn global attention to AI's global issues and triggered extensive discussions on the potential risks associated with its development. This paper points out that international governance of AI cannot simply be regarded as global governance of emerging technologies. The technical characteristics and issue attributes of AI pose three international governance challenges: lack of practical experience and leadership capabilities among countries, strengthening spillover between domestic and global issues, and friction between old and new governance paradigms. The international governance of AI is evolving under the framework of “stakeholder governance”, integrating elements of “sovereign state strategic competition”, and exhibiting agile governance characteristics among various stakeholders. To conduct an inclusive framework for international governance of AI, this paper advocates governance principles, agile classification, building connection bodies, and technical autonomy to stimulate thought and action among various stakeholders.

AI and Social Fairness: International Experience, Mechanism and Public Policy

Chen Binkai and Xu Xiang

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The development and progress of artificial intelligence (AI) technology has a profound impact on economy and society. As a new general-purpose technology, AI has replaced a number of existing jobs, which has a negative impact on labor market and incomes. On the other hand, it has also created some new employment opportunities and increased productivity in some sectors. Through studying historical experience and country comparison, this article finds that since the beginning of the information technology revolution in the 1940s, technological progress has had a more significant role in the expansion of global income inequality, and it shows a more obvious country difference. By analyzing the main mechanism of AI technological progress affecting income inequality, this article finds that the substitution effect of AI on labor force occupies a dominant position, and, together with other effects, it expands income inequality and leads to social inequality. This article further discusses public policy options to deal with the impact of AI, and proposes that promoting equal opportunity should be the main means to promote social equity.

Global Integrated Circuit Industrial Chain: Distribution, Techno-economic Characteristics, and Challenges

Cai Yuezhou, Wei Jieyu and Zhong Zhou

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Although the integrated circuit (IC) industrial chain is distributed globally, the real participants are limited to a few economies such as the United States, the United Kingdom, the Netherlands, Germany, Japan, South Korea, China's Taiwan, and the Chinese mainland, and each has its own expertise and advantages. From a historical perspective, this distribution pattern has been largely driven by the US government and companies. From the perspective of techno-economic characteristics, the current IC industry chain features "ultra-long industrial chain and concentrated production capacity", "front-end locking in back-end induced by concentration", "limited capacity of niche market in subdivided links", and "financial countermeasures to upstream enterprises formed by downstream demand". In the context of deglobalization, the industrial chain is in a fragile "edge balance" state. The continuous technological progress and the continuous refinement of the division of labor have reduced the resilience of the industrial chain, and the smooth operation of the industry has become even more difficult and fragile. The risk of industrial and technological decoupling between major economies has pushed up the costs of digital transformation. The international community should abandon confrontation, strengthen cooperation, and actively build a positive and relaxed environment for industrial development.

Experiences, Achievements, Challenges and Policy Reflections on China's Carbon Emissions Trading System

Qi Shaozhou and Cheng Shihan

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The carbon emissions trading system (ETS) serves as a crucial policy tool in China for controlling greenhouse gas emissions and achieving its dual carbon goals. Over the past decade, China has achieved some positive results in its pilot ETS program and accumulated rich experiences for the development of a national ETS market. This article first summarizes the country's experiences in building the pilot ETS in six aspects: legal and regulatory safeguard, industry coverage, allowance allocation methods, financial product innovation, data monitoring, reporting and verification, and capacity building activities. Then, with reference to the impact assessment guidelines of EU ETS, it establishes a three-level multidimensional assessment system to conduct a comprehensive post-assessment of the country's pilot ETS and its allowance allocation methods based on the principles of effectiveness, efficiency, and consistency. Finally, combining the experiences and lessons learned from China's pilot ETS and ETS in other countries, this article analyzes the challenges facing China's national ETS in

eight aspects: coverage, cap setting, allowance allocation method, trading system, price mechanism, data quality, capacity building, and policy coordination, and offers corresponding policy reflections from a problem-solving perspective. The article can provide detailed policy references for China to better utilize the ETS, reduce the overall societal costs of carbon emissions reduction, promote innovation in low-carbon technologies, and facilitate the low-carbon transformation of industries amid the country's energy transformation efforts.

Differences, Convergence and Impacts of Climate Governance Approaches of the US and EU

Jiang Qingyun and Yang Jie

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In terms of actions to address climate change, due to different development stages and industrial structures, countries generally should consider their own interests when they map out their emission reduction plans. The US and the EU, as the two of the most important economies in the world, have taken different emission reduction approaches, with the US forming an emission reduction model dominated by financial incentives, while the EU adopting an emission reduction mechanism centered on carbon pricing. Competition between the two countries in green industry has somewhat intensified. Based on the analysis of the historical policies and current main measures of the US and the EU in response to climate change, this article points out the main differences and spillover effects in the climate governance paths between them. However, on issues such as the promotion of emission reduction targets, the governance of trade in steel and aluminum products, and the security of key mineral supply chains, the US and the EU have coordinated through policy dialogue and cooperation mechanisms, and a trend of policy convergence between the two economies is emerging. They have, through legislation, adopt green industrial policies to bind climate goals to industrial resilience, thus constraining China's industrial development. Against the backdrop of the US binding climate governance to industrial competition, trade and national security, China should take active measures to amend its climate policy and green industry development strategy, and respond through diversified global market layout, clean technology innovation and participation in multilateral climate governance.

Chinese Transition Finance: Stylized Facts, Future Prospects and Existing Challenges

Liu Yao, Zhang Bin and Zhang Ming

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The process of China's economic transformation and upgrading cannot be separated from the strong support from transition finance. The Chinese-style transition finance is still in its early development stage; the scale and product types of the transition financial market are relatively limited, mainly concentrated in the field of emission reduction projects; under the constraint of the dual carbon goal, China's financial institutions have become important participants and supporters of transition finance. China is strengthening the building of the transition finance framework. Currently, China's transition finance is faced with many challenges, such as lack of standards and road map, weak information and data foundation related to industry and projects, immature product design mechanism, and urgent need to improve the sustainability of transition finance business model. In the future, China's transition finance market will become more active, and the scale of transition finance products will also see explosive growth. Therefore, China should set up structural transition finance standards as soon as possible, strengthen standardized information disclosure of transition finance products, connect with the financial market in terms of connectivity and international cooperation, and promote the standardization of transition finance markets and diversification of products as soon as possible. Meanwhile, the government, financial institutions and transition enterprises should join hands to build an efficient and sustainable Chinese-style transition finance business model and incentive mechanism.