Impact of Artificial Intelligence on Macroeconomics and Finance, and AI Regulation

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Abstract: *Recently, the Sixth Bund Summit was co-hosted by the China Finance 40 Forum and the China Center for International Economic Exchanges. Experts attending the summit discussed the development of artificial intelligence (AI) and its impact on macroeconomics and financial stability.*

The consensus at the summit was that AI is still in its nascent stage. While significant progress has been made in applying large models to commercial and engineering fields, AI's potential in driving economic growth and productivity has yet to be fully realized.

In terms of macroeconomics, in the short term, the high demand for AI-related resources combined with insufficient supply will lead to increased labor input without a corresponding rise in output, ultimately resulting in a decline in productivity. During this period, central banks may face increased difficulty in controlling inflation, requiring higher interest rates to stabilize the macroeconomy. In the long run, AI holds significant potential to enhance productivity. On employment, while AI may replace certain jobs, it is unlikely to cause widespread unemployment. However, the problem of inequality could worsen. One key to addressing this transformation is to strengthen education. In the financial sector, the application of large models could lead to profound transformations, while also posing significant risk management challenges for financial institutions and regulators. Regarding AI regulation, the summit outlined five guiding principles, including the need to balance benefits and risks.

I. Definition and Current Development of Artificial Intelligence

Experts attending the summit pointed out that the definition of artificial intelligence (AI) remains unclear, and AI is still in its early stages of development, with its potential in driving economic growth and productivity far from fully realized.

Jason Furman, professor of Harvard University and former Chairman of the Council of Economic Advisers of the White House, believed that the precise meaning of AI is still ambiguous. The type of AI currently in widespread use is generative AI, which primarily studies tasks that humans have already accomplished, then recombines and reshuffles this information to answer new questions or repeatedly address frequently asked questions. In many respects, generative AI appears to mimic human behavior. For instance, we can engage in conversation with chatbots like ChatGPT, which seem highly human-like, but they do not represent so-called artificial general intelligence (AGI). AGI, in essence, would exhibit human-like characteristics across various domains, including creativity.

Yang Qiang, chief AI officer at WeBank, noted that AI development is still in its infancy, with many unresolved issues and its potential yet to be fully unleashed. If AI's development were compared to human growth stages, it might not even be one year old. Although

AI has seen widespread applications, its potential in driving economic growth and productivity has not been fully tapped. One key reason is that current AI primarily relies on statistical principles through Transformer and Attention architectures, which come with certain limitations. The upper limits and boundaries of these technologies are still unclear. For example, does having more data always result in better outcomes? When does the scaling law break down? The scaling law suggests that increasing model parameters (model capacity), the size of datasets (data volume), and computational load (training duration) leads to continuous improvements in the performance of large models. While large models have made significant progress in commercial and engineering applications, academia still lacks systematic research on the underlying principles and mechanisms of these models. This has resulted in poor interpretability and transparency, which restricts their application in high-risk areas such as finance and healthcare.

II. Impact of Artificial Intelligence on Macroeconomics and Employment

Furman offered an in-depth analysis of how AI affects the economy, its impact on macroeconomics and employment, as well as the appropriate responses to these challenges.

Furman first explained that AI's impact on the economy can be categorized into two types. The first type involves AI performing tasks that humans already do, but with greater speed, efficiency, and lower costs. The second type is that AI creates entirely new applications that were previously unimaginable to humans. These innovations are not about replacing humans but complementing and collaborating with them. This area is filled with infinite possibilities—Microsoft even named its AI product "Copilot". Therefore, AI can both replace certain human jobs and significantly boost human productivity. The critical questions we face are when this transformation will occur and how different types of intelligent applications will evolve.

Regarding AI's impact on macroeconomics, Furman believed that in the short term, productivity may decline, presenting a "J-curve", and inflation management will become more difficult. On the demand side, AI development is driving continuous growth in the construction of data centers and their energy requirements. On the supply side, since the application of AI is still in an exploratory phase, there is insufficient supply in the short term, making it difficult to achieve output growth. As a result, labor input increases without corresponding increases in output, leading to a decline in productivity, thus presenting the "J-curve". Additionally, central banks may face greater challenges in managing inflation, requiring higher interest rates to stabilize the macroeconomy. In the long term, however, AI is expected to significantly boost productivity. This trend will drive income growth and rising interest rates, with far-reaching implications for the global economy.

Regarding the impact of AI on employment, Furman stated that while AI may replace some jobs, it is unlikely to lead to widespread unemployment. However, it could exacerbate issues of inequality, and one key to navigating this transformation lies in strengthening education.

Historical evidence shows that although technological advancements lead to structural changes in employment, they do not caused mass unemployment. Over the past 200 years, the proportion of the population working in agriculture has drastically declined, yet we have neither faced food shortages nor large-scale unemployment. There are three main reasons for this. First, emerging industries have created vast numbers of new jobs—200 years ago, no one could have imagined professions like those in the financial sector. Second, as living standards have risen, the demand for services has expanded significantly. While people 200 years ago may have had a vague understanding of service-related jobs, they likely would not have predicted a future where people could afford to dine out regularly or travel extensively. Third, many technologies replace only parts of jobs rather than entire occupations. However, technological progress also brings some challenges, such as increasing income inequality, as people lower their wages to compete with robots.

Furman emphasized the need for proactive measures to address these changes, especially focusing on the role of education. In the past, society did not passively accept technological transformations—when agriculture declined, we made high school education widely accessible; As manufacturing faded, we expanded universities significantly. Therefore, we must adopt similar large-scale measures to meet this challenge, rather than assuming that positive outcomes will happen automatically. A key aspect of this transformation is education—the more education a person receives, the better equipped they are to withstand these disruptions.

III. The Impact of Artificial Intelligence on the Development of the Financial Industry and Financial Stability

Tobias Adrian, director of the Monetary and Capital Markets Department at the International Monetary Fund (IMF), noted that the impact of AI on the financial industry can be divided into three stages. Firstly, machine learning has already led a revolution in trading. Over the past decade, financial trading has undergone a fundamental transformation, particularly in the most liquid markets, where transactions heavily rely on algorithms. High-frequency trading algorithms have enhanced market efficiency and reduced financing costs for households, businesses, and governments. Secondly, the field of credit scoring has greatly benefited as well. AI has improved credit assessment models, increasing financial inclusion by better distributing credit among different entities, ultimately benefiting a broader population. Lastly, at the cutting edge, achieving artificial general intelligence (AGI) in finance could fully automate decision-making in financial markets and institutions. However, there is significant skepticism about whether this goal can be realized. While theoretically possible, it requires the development of true AGI.

Xiao Gang, former Chairman of the China Securities Regulatory Commission, pointed out that the application of large models in the financial sector will not only reshape banks' business processes, organizational structures, and service models, but also bring about profound changes across the entire industry. Since 2024, many financial institutions in China have started experimenting with large models. Beyond data, computing power, and algorithms, the performance of large models in the financial sector depends on three key factors. First, technological maturity. The financial industry demands extremely high levels of accuracy and security, but the application of large models in finance is still in its infancy. Issues like hallucination of models and inadequate training on specialized financial data limit their deep integration into financial scenarios. Second, policy support. The financial industry is heavily regulated, and the use of large models requires clear regulatory policies. Although there are already macro-level policy guidelines, specific regulations for applying large models in finance still need to be refined. Third, scenario matching. When financial institutions adopt large models, the most important task is to identify and select appropriate use scenario.

Regarding the impact of AI on financial stability, Adrian noted that both financial institutions and regulators will face significant challenges. First, AI increases the complexity of trading behavior, making risk assessment more difficult and introducing additional risks for financial institutions. Second, AI heightens cybersecurity risks. While AI can enhance the operational efficiency of financial institutions, it can also be exploited by malicious actors to launch large-scale cyberattacks, harming the cybersecurity resilience of financial institutions. Third, although AI excels at evaluating individual risks, it remains unclear whether it can capture the general equilibrium effects that arise from widespread use of these tools, as well as the potential impact these effects could have on the financial sector.

IV. Recommendations for Regulating Artificial Intelligence

Furman also proposed five principles for regulating AI.

First, balance benefits and risks. Some argue that AI development should not proceed until all risks are

identified and mitigated. However, slowing down AI deployment will also bring many risks, such as being unable to effectively address challenges like climate change and digital education. Therefore, when regulating AI, we need to consider not only the risks of misuse but also the potential risks of overregulation that could prevent society from reaping the benefits of AI.

Second, compare AI with alternatives, rather than treating it as an all-powerful solution. For example, the fact that self-driving cars may cause accidents should not be a reason to ban them. Instead, we should ask whether self-driving cars have fewer or more accidents than human-driven cars. In other words, under the same regulatory conditions, does AI perform better or worse than humans?

Third, use sector-specific regulation whenever possible. Regulation should focus on specific sectors, and there is no need to create a single overarching AI regulatory authority. Given the complexity and specificity of each field, a general regulatory framework might not effectively address the unique challenges in each domain. For instance, financial market regulation requires a deep understanding of market dynamics and financial stability, and a broad AI regulatory body might not be equipped to handle these intricacies. Regulatory bodies in other sectors, such as the U.S. Food and Drug Administration (FDA), also need to enhance their understanding of AI, enabling them to more effectively regulate AI applications in the respective fields.

Fourth, avoid creating regulatory moats that protect large companies. While many large corporations welcome regulation, partly out of a sense of public welfare, which should be encouraged and applauded. But there it is also partly because they know only they have the capacity to comply with regulatory requirements, while their smaller competitors do not. This type of "support" is questionable.

Fifth, many solutions to the challenges posed by AI do not directly involve regulating AI itself; rather, they depend on broader policies related to the labor market, tax systems, and so on. For instance, structural changes and potential large-scale unemployment caused by AI development could be addressed through policies like universal basic income (UBI) or other forms of subsidies. These measures are not directly tied to AI but are instead related to a country's fiscal situation. Furman noted that there is currently no urgent need to implement UBI or other subsidies. However, if AI leads to significantly higher productivity gains and more widespread job displacement, then such measures may become necessary, and by that time, the fiscal capacity to fund these subsidies should also be available.