

Comment on October 7 advanced computing and semiconductor manufacturing equipment rule (RIN 0694–AI94)

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This comment is authored by Lennart Heim and Markus Anderljung. It represents the view of the authors, rather than the views of their organization, the Centre for the Governance of AI. For questions about the submission, reach out to Lennart Heim (lennart.heim@governance.ai).

About the authors

Lennart Heim focuses on compute governance. His research interests include the role of compute in the AI production function, the compute supply chain, and forecasting emerging technologies. He's also a member of the OECD.AI Expert Group on AI Compute and Climate, a steering group member at Tony Blair Institute for Global Change's National Compute Index, and a Strategy Specialist at Epoch. He has a Master's in Computer Engineering and worked at ETH Zürich on Machine Learning. He has published papers on e.g., trends in the use of compute to train notable AI models and whether the scaling of frontier large language models will run out of publicly available training data.

Markus Anderljung's work aims to identify and improve AI governance policy recommendations. His research focuses on compute governance, responsible research norms in AI, and risks from the misuse of AI. He was previously seconded to the UK Cabinet Office as a Senior AI Policy Specialist, the Centre for the Governance of AI's Deputy Director, Executive Director of EA Sweden, and Senior Consultant at EY Sweden. His work has been published in Science, Nature Machine Intelligence, International Joint Conference on AI, Journal of Artificial Intelligence Research, the Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society, and has been presented to the American Political Science Association, Brookings Institution, and the Bipartisan Policy Center. He is based in San Francisco, California.

Executive Summary

We welcome the opportunity to respond to the Bureau of Industry and Security (Department of Commerce) Interim final rule on advanced computing and semiconductor manufacturing equipment rule (RIN 0694–AI94) and look forward to future opportunities to provide additional input. We offer the following submission for your consideration.

The October chip export controls were implemented to prevent human rights abuses and protect international security interests by making it more difficult for the government of the People's Republic of China (PRC) to attain advanced AI capabilities. Identifying AI-specific compute¹ as an important input to such capabilities, the export controls aimed to (i) solidify existing US efforts to stop the development of domestic high-end chip manufacturing capabilities, ensuring that the PRC's AI capabilities are dependent on foreign-produced chips and (ii) restrict access to certain high-end AI chips crucial for training and deploying frontier AI models. Given the likely importance of AI capabilities to national security and economic prosperity, we should expect significant pressure for the PRC to stay at the frontier of AI. Any and all viable paths for doing so may be explored. This pressure will mount over time, as the importance of AI technology grows and as the AI-relevant integrated circuits (ICs) produced outside the PRC outpace the technology AI-developers in the PRC, including the PLA, have access to. In light of this, the US government should continually assess the effectiveness of these controls. If they do not serve their intended purpose the US government should consider whether there are worthwhile adjustments to the regime that could ensure its effectiveness.

To estimate the likely effectiveness of the controls, our submission considers pathways by which the PRC government or government-linked AI developers could access sufficient computing resources to train state-of-the-art AI models, across domains such as natural language processing and computer vision.

It is worth noting that these export controls and the recommendations in this comment could form the basis of an international non-proliferation regime for AI, as AI technologies become more advanced and dangerous. Such a regime could seek to ensure that offensively dominant AI capabilities are not widely accessed by ill-intentioned actors and allow wider distribution of the benefits of AI.

Our response consists of two main sections. First, we discuss whether PRC-based AI developers can develop frontier AI models using chips that are not covered by the recent export controls. Second, we explore pathways where PRC-based developers get access to covered chips or the capabilities they produce.

¹ "Compute" refers to computational infrastructure, whereas AI-specific compute describes the specialized computational infrastructure to efficiently execute AI workloads, such as AI chips.

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Lennart Heim reports no conflict of interest.

Markus Anderljung's fiancé is an employee of and therefore shareholder in OpenAI, a leading AI company.